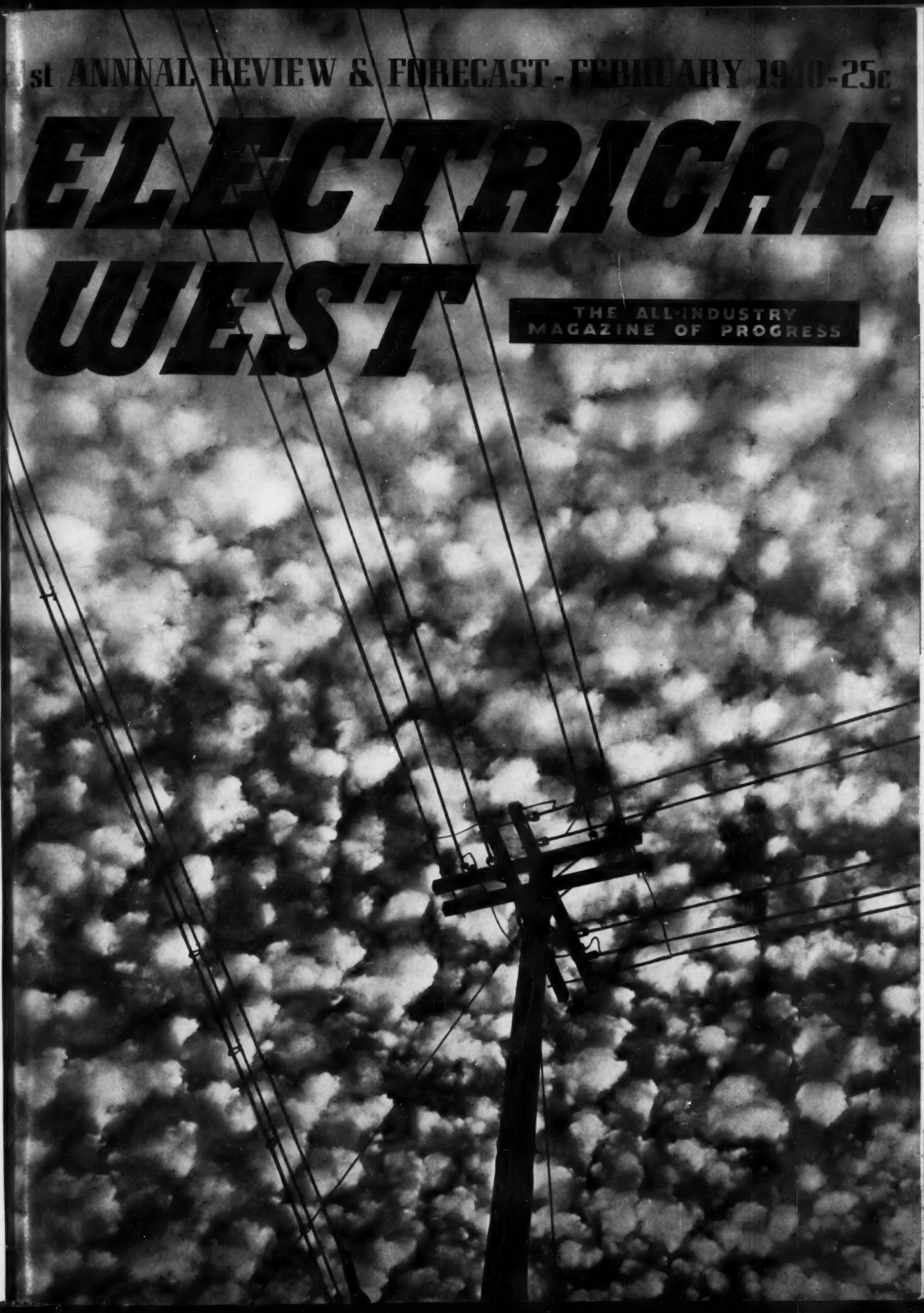
st ANNUAL REVIEW & FORECAST - FEBRUARY 19 0 - 25c

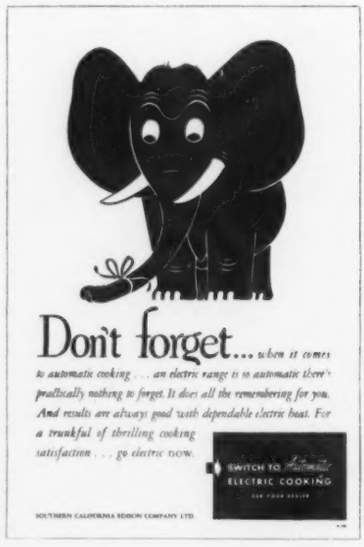
# ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS



Say... an electric range is certainly the cat's whiskers. Folks who cook electrically are so happy they practically purr . . . an electric range is so clean, fast, easy and economical. And when it comes to long, dependable service . . . not even a cat has such a long life . . .
SWITCH TO Electric ELECTRIC COOKING
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

Ah-h . . . take it from me, kitchens with electric ranges are simply lovely . . . mighty sweet! Ask some of your neighbors who cook electrically . . . listen to them describe the morning-glory freshness and cleanliness of their kitchens . . . and with a lot less buzzing around too . . .
SWITCH TO Clean ELECTRIC COOKING
SOUTHERN CALIFORNIA EDISON COMPANY LTD.


Don't forget... when it comes to automatic cooking . . . an electric range is so automatic there's practically nothing to forget. It does all the remembering for you. And results are always good with dependable electric heat. For a trunkful of thrilling cooking satisfaction . . . go electric now.
SWITCH TO Automatic ELECTRIC COOKING
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

Listen.. take a tip from me, if you want to learn the real meaning of making thrift . . . get an electric range. It costs less to operate an electric range than you may think. Ask a few actual users . . . you'll find them enthusiastically "nutty" about their electric ranges.
SWITCH TO Thrifty ELECTRIC COOKING
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

No Ma'am... there's no monkey-business with an electric range . . . no hanging around the kitchen . . . and no spying to see "if it's coming along all right". An electric range does what you want it to do whether you are there or away . . . without thought or SWIFT). ASK YOUR DEALER.
SWITCH TO Automatic ELECTRIC COOKING

See... look around when you select your next range . . . you'll find the modern electric range head and shoulders above old fashioned methods . . . electric cooking stretches the leisure hours and shortens the work.
SWITCH TO Modern ELECTRIC COOKING
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

## Promoting Electric Cooking

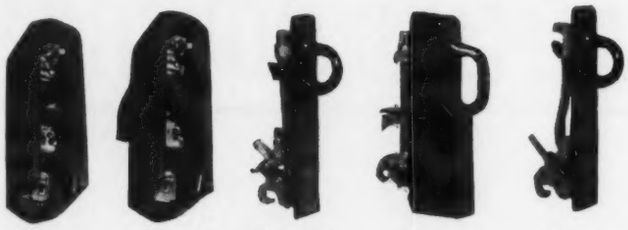
**MONTH AFTER MONTH EDISON ADVERTISING HELPS BUILD BUSINESS FOR ELECTRICAL DEALERS. IT DOES THIS IN EDISON TERRITORY BY KEEPING PROSPECTIVE RANGE BUYERS AWARE OF ALL THE ADVANTAGES OF ELECTRIC COOKING.**

2-40

SOUTHERN CALIFORNIA Edison

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), February, 1940. Vol. 84, No. 2. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
Copyright, 1940. McGraw-Hill Company of California.

# WE'VE BEEN TELLING YOU THIS—



50 amp 5 kv | 50 amp 7.5 kv | 50 amp Single-element | 50 amp Two-element reclosing | 100 amp Disconnect

## 2 HOUSINGS AND 3 DOORS MEET 80% OF YOUR CUTOUT REQUIREMENTS

# Now FOR THE OTHER 20%

## —here's a 100-ampere line with a new 2-element reclosing door

As long as we have been in the cutout business, we've never been able to offer a better, more complete line of enclosed, expulsion-type, fuse cutouts—and doors that are interchangeable, which makes possible true flexibility of cutout application.

The G-E 100-amp line—now made complete with a 2-element reclosing door—enables you to cut costs still further, by lower inventories, and fewer parts to handle in the stock room and on your trucks. Now, you can get a single-element door or a 2-element reclosing door or a disconnect door—all in both the 50-amp and 100-amp lines.

*Two housings and three doors* is General Electric's way of helping you cut costs through flexibility of cutout application. The new 100-amp recloser is completely described in a new supplement to bulletin GEA-2707. Ask our nearest sales office for a copy. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

340-42

# BETWEEN THIS MONTH'S COVERS

## The Survey

THE BOOK this month constitutes a report on the state of the electrical industry in the Far West. In order to throw the main facts into prominence and yet present the detail which is essential to a complete report, the material is presented in three parts. The first consists of four tables of basic data for the eleven Western States. The second surveys 1939 and 1940 utility construction programs. The third covers sales activities for the two years. Each of the last two sections is headed by an interpretive article summarizing the main points. This is followed by detailed reports from every section of the West, arranged alphabetically by states.

## The Outlook

WHAT KIND OF 40's (p. 35): Last year generation rose 9% to a new high. More than 125,000 customers were added in the West. The pace of electrical building is expected to quicken this year. In addition to the fact that business signs are favorable for the nation as a whole, both people and industry are moving West. Some feel that the present upturn signifies the beginning of a long period of Western expansion along new economic fronts.

## The Budget

PLANT EXPANSION FOR '39 AND '40 (p. 38): Reports from the chief engineers of 41 private and municipal electric utilities in the West show a total of $80,500,000 budgeted for additions and improvements to plant this year. The figure is 9.6% higher than the actual expenditures last year. In addition to this, it is probable that several unbudgeted jobs will be undertaken before the year is over. Most of the larger projects for 1940 are additions to steam generating capacity, but the biggest part of the budget will go for hundreds of smaller items, representing enlargements of capacity at every point. The 1940 electrical plant budget for Western systems constitutes 14% of the 600 million estimated for the nation as a whole.

## Upswing

UP GO SALES (p. 53): To achieve healthy increases in company figures during 1939 meant active sales of appliances. Because some companies have ceased to merchandise actively themselves or have no means of obtaining dealer sales records as yet, figures on total dollar volume of appliance sales in dollars are not complete. But for the companies reporting such figures, estimates based on experience and local reports, the average dollar total spent per 1,000 homes for the major appliances is indicative of the kind of selling job done in various areas last year.

## Leaders

IN THE HIGHEST average sales per home, Northwestern Electric Co. dealers showed the way with $67.32 reported. In number of ranges per 1,000 homes, Sierra Pacific led with 75. Calif.-Oregon Power, with 43.3 topped water heater sales per 1,000 homes, with Los Angeles Bureau of Power & Light the winner in refrigerator sales at 126.2. Washer figures were less complete, but Northwestern Electric again led the way with 106.9 washers per 1,000 homes. And Los Angeles Bureau ranked first in ironer sales with 12.6. Northwestern also was the winner in IES lamp sales, chalking up 281 sales per 1,000 homes.

## Saturation

SATURATIONS of appliances increased in 1939. The interesting thing about these saturations is that the greatest volume of sales still seem to come from territories where the saturation is highest. In range saturation, Sierra Pacific climbed to the top in 1938 and remained there last year with a 55.6% saturation. Tacoma led in water heater saturation with 35%. Refrigerator returns were incomplete but San Joaquin Division, PG and E, was highest with 72%. Washers, also incomplete, found Eastern Oregon Light & Power at the top with 83%.

## Revised Plans

A HOTEL KEEPS IN STEP WITH ELECTRICAL PROGRESS (p. 80): Back in the '29's (for that year was a decade long), Canadian National began to build the Hotel Vancouver. But only this past year was this handsome edifice completed. Original electrical specifications had to be completely revised to suit the modern age of electrical engineering. On an average of seven electricians were employed steadily for the past six years on this job by Hume & Rumble, Ltd., electrical contractors with R. H. Williams, chief engineer, in charge.


| | |
|---|---|
| 1940 Appliance Review | 4 |
| New Products | 22 |
| Product Data | 24 |
| Electra's Husband | 30 |
| Industry | 35 |
| Engineering | 38 |
| Sales Parade | 53 |
| Sales Guide | 67 |
| Editorials | 74 |
| Associations | 76 |
| Lighting | 80 |
| News of the Industry | 86 |
| Profiles | 102 |

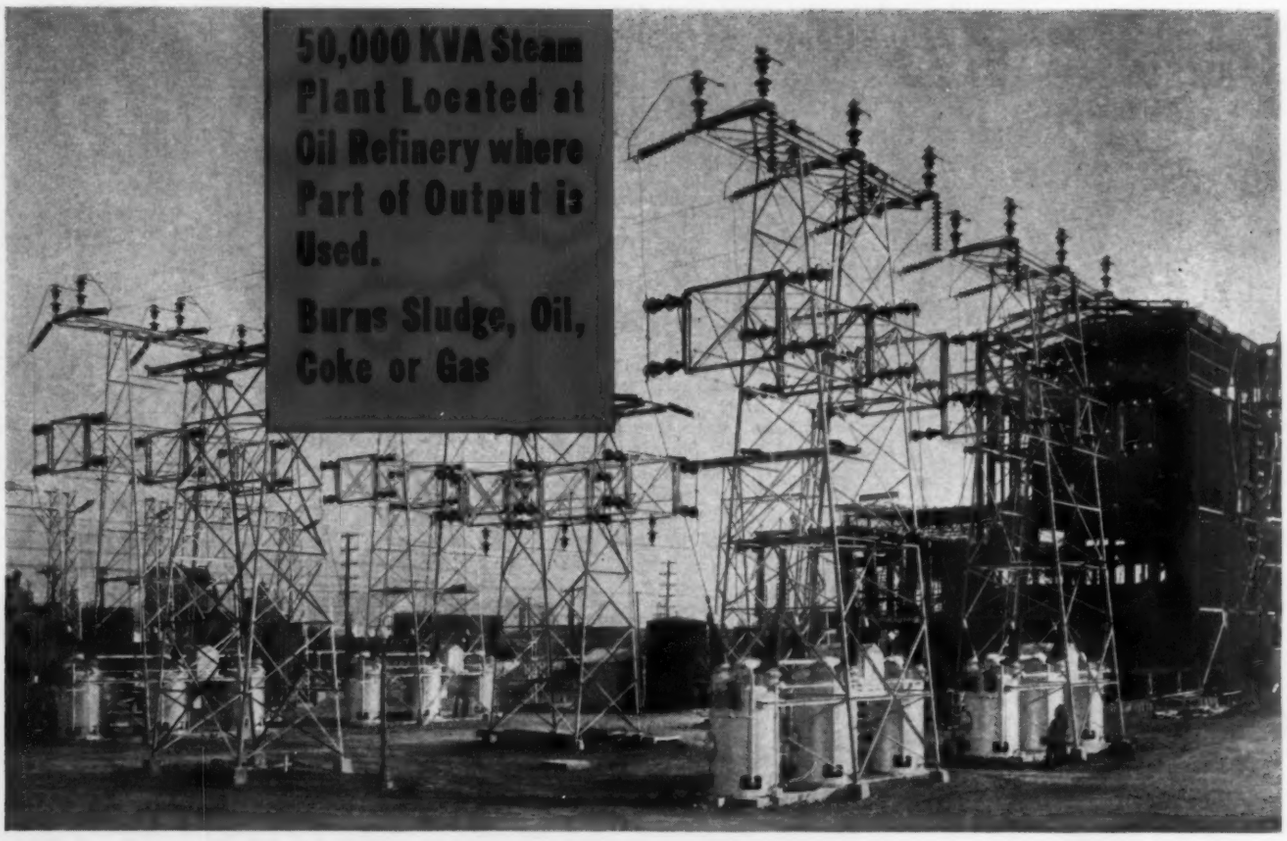

Cover: PG and E lines in Marin County, California, photographed by Bill Saunders, exclusively for ELECTRICAL WEST.

## Ballots

ASSOCIATIONS (p. 76): Elections and announcements of coming conventions formed the bulk of news of western associations and leagues. The former were held by the Electrical League of Utah, the International Assn. of Electrical Inspectors (Rocky Mt. chapter), Producers' Council Club, Electrical Development League of Southern California, and Electrical Contractors Assn. of San Francisco, Inc. The latter concern the Pacific Coast Electrical Assn. (May 22-24), National Electrical Wholesalers Assn. (Feb. 15-17), Pacific Division. New branch of the Washington Board Utility Commissioners Assn. has been formed in Puget Sound with condemnation proceedings against private utilities their objective and ultimate aim.

## Bulletin Board

NEWS OF THE INDUSTRY (p. 86): The California Water Project Authority asked by Sacramento Valley representatives to take steps toward the distribution of Central Valley electric energy . . . Cases involving the Federal government's acquisition of power sites in Washington are expected to go to Spokane Federal Court . . . Washington PUDS granted free access to books, records of Puget Sound Power & Light . . . Skamania County PUD (Wash.) purchases West Coast Power . . . Robert Beck named Grays Harbor PUD manager . . . McMinnville, and Monmouth, Ore. sign Bonneville contracts, while Tacoma may become a Bonneville customer soon . . . Central Arizona reduces electric rates in Phoenix area . . . Alaska, with total year-round water power resources set at 800,000 hp. capacity, may become full territorial government . . . George Fleming selected as Dept. of Interior representative on Hetch Hetchy review . . . Prominent leaders in the electrical industry of the west pass away, among them George A. Campbell, Sierra Pacific Power; Arthur H. Markwart, PG and E, Albert Elliot, NEWA attorney and secretary, Paul Ost, San Francisco Electric Power Bureau.




### OIL CIRCUIT BREAKERS

Yes, safety and lowest cost over the years are assured by careful engineering of breakers.

You have quick, safe interruptions and fast closing. You save on operating costs. Our Expulsion Chambers, included in Pacific Electric Breakers at no extra cost, have proved reliable. They save contact burning, give short arcing time and save oil carbonization. The Motor Control provides fast opening and closing and offers perfect synchronizing.

Breakers pictured are equipped with oil-filled bushings. Type RWE, 115-kv., with Type MW-40 Motor Control. NEMA and AIEE Standards.

**EXPULSION CHAMBER**

Cross-section view of the famous Pacific Electric Expulsion Chamber. *Write for full facts.*

# Reliability Assured
## with Modern Breakers

**Utility engineers designed this up-to-the-minute 50,000-kva steam plant.**

**To assure the most reliable service at the lowest cost, they are building the plant right at the oil refinery where part of the kilowatt output will be used along with steam from the new plant for cracking gasoline.**

**And this is just one of three similar developments in northern California. Of course, these steam plants will be interconnected—one with the other, and with important sub-stations.**

**Pacific Electric supplied four Motor-Controlled Oil Circuit Breakers for the above plant. For full details on this modern equipment, ask a Pacific Electric representative or write today. You really need Pacific Electric details to see the profitable benefits that we offer you.**

C. H. Cutter, 1006 Securities Bldg., Seattle, Wash.
Urban Halliday, 230 U. S. Nat'l Bank Bldg., Denver, Colo.
G. B. Kirkwood, 437 S. Hill St., Los Angeles, Calif.
J. E. Redmond, 448 W. Madison St, Phoenix, Arizona

*Other Representatives in Principal Cities*

# Pacific Electric Mfg. Corporation

5815 THIRD ST., SAN FRANCISCO, CALIF. DUNES HIGHWAY, GARY, INDIANA

Representatives in Principal Cities

It might surprise you . .

to compare anchor installation costs

DUAL NEVER-CREEP NO. 1110 $1.29

**$2.45 approximate cost INSTALLED complete with rod**

The time element plays an important part in the cost of anchor installations. Compare the installation time of the Dual Never-Creep with the time required to install a treated log, concrete or scrap iron dead man, add the cost of anchors and rods, compare the efficiency of all types and the answer is simply this: Dual Never-Creep Anchors are sound investments that save you time and money.

The calculation above for installing the No. 1110 Dual Never-Creep is based on actual conditions checked by time studies figuring a wage scale of $1.40 per day for labor. These studies reveal that on an average, a Dual Never-Creep Anchor can be installed by one man in less than 30 minutes using an 8-in. auger. Hole boring machines will reduce this installation time to less than half.

Where it is impossible to bore holes, the Dual Never-Creep may be installed as a dead man using either a threaded or Never-Creep rod and give you extra protection against deterioration.

When installed, the Dual Never-Creep Anchor pulls 100% against solid earth. There is no danger of slipping or creeping. Time tests taken over a period of years, prove the superior holding power and long life of Never-Creep Anchors.

It pays to use this quicker, easier to install, more efficient type of anchoring.

| No. Cat. | Size | Area | Weight | Price less rods |
|---|---|---|---|---|
| 1110 | 7"x16¼" | 110 sq. in. | 14½ lbs. | $1.29 |
| 1125 | 7¾"x16 13/16" | 125 sq. in. | 19¼ lbs. | 1.47 |
| 1140 | 8"x18 5/16" | 140 sq. in. | 24 lbs. | 1.70 |
| 1176 | 10"x17⅝" | 176 sq. in. | 27½ lbs. | 2.10 |
| 1322 | 13"x23⅝" | 322 sq. in. | 60 lbs. | 4.98 |

Distributed by G. E. Supply Corp.

A·B·CHANCE CO. CENTRALIA MISSOURI


# 1940 Appliance Lines On Display

## General Electric Ranges

Further improvement in the Calrod high-speed surface unit, which is the heart of the G-E range, leads the listed features of the 1940 G-E range line. Four classifications of ranges are featured—a deluxe series of two models with Tel-a-Cook lights to signal the different switch stages of position in color at a glance and "Tripl-oven" with Calrod oven units; a master series of three models, with all-porcelain body and striking new styling; a special series of two models and one model designed for large capacity in small space.

For the two top models in the deluxe series, a new high-speed five-heat thrift cooker has been developed which has greater cooking speed. A redesigned cooking top, automatic oven lighting, bright-finish oven shelves are other new features.

Accessories for the 1940 G-E ranges make the new line distinctive. These include a sliding cutlery tray; a new time-chime clock, a new self-starting timer, a cooking-top lamp with removable glass shade, shelves, condiment jars and base cabinets.

## General Electric Refrigerators

Stressing selective air conditions to a greater extent than ever before through the introduction of controlled humidity and a newly developed air filter, General Electric has presented three new lines of refrigerators for 1940 which offer in many models increased capacity and operating efficiency over last year's models in addition to greater food-preserving ability.

Particularly outstanding in the new group is a low-priced eight cubic-ft. model designed for rural customers. Over-all theme for 1940 G-E refrigerators is embodied in the statement—"We believe you cannot buy a refrigerator that will cost you less to own than a General Electric."

The new lines consist of a "four," three "fives," four "sixes," three "eights," a "twelve," and a "sixteen." Two "eights" in the "Deluxe" series have a 40% increase in refrigerating capacity and a 15% increase in efficiency over the corresponding 1939 models, and the motor hp. has been increased from 1/8 to 1/6 hp.

The unit retains such standard G-E features as metal to glass leads; cast aluminum

IS EASIER TO INSTALL because it is all one unit — there's no loose part to hold. The nut swings out of the way for installation — hinges back squarely on the bolt in perfect register with the threads and starts easily. — *Try it!*

JASPER BLACKBURN PRODUCTS CORP.

Main and Clinton Sts. ST. LOUIS, MO.

THERE ARE "BESTS" IN EVERY INDUSTRY

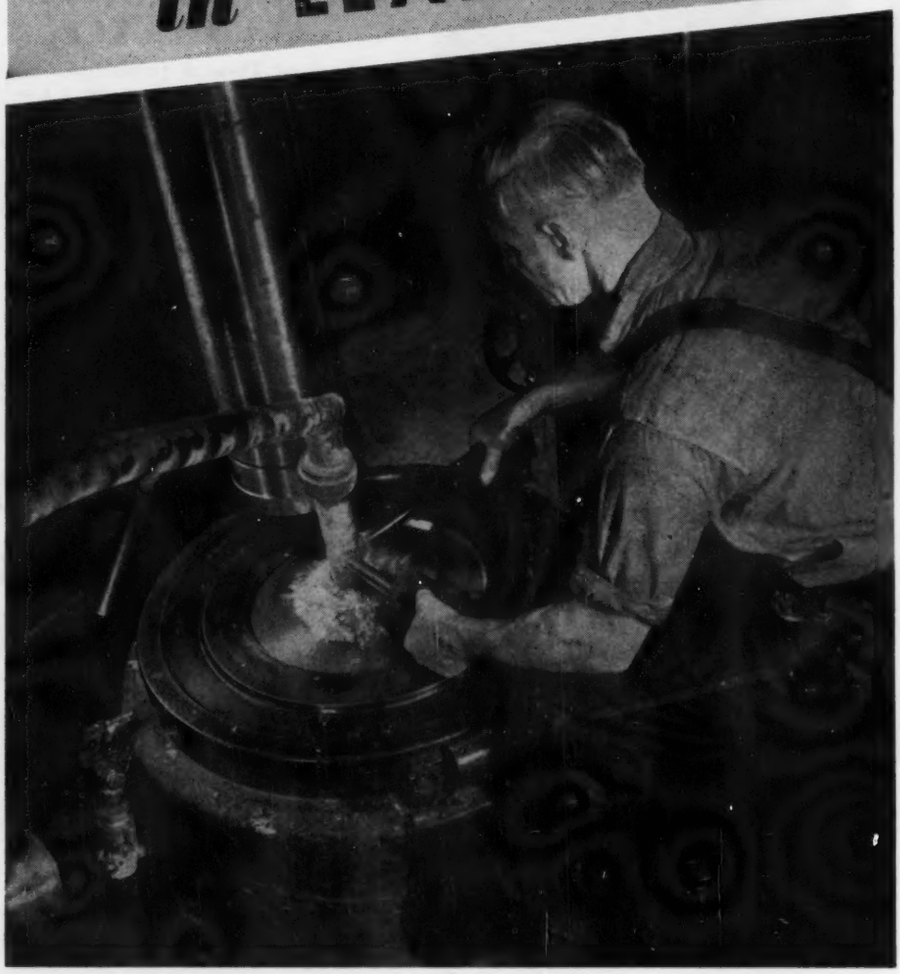
IN ELECTRICAL APPLIANCES IT'S

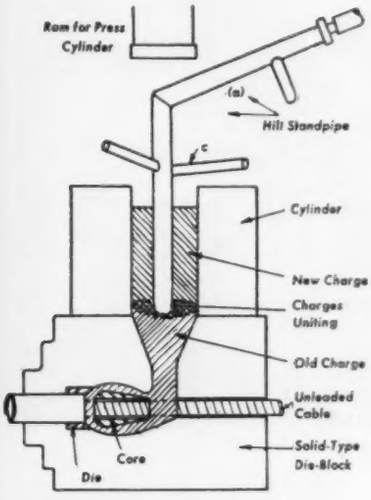
*Sunbeam*

*Automatic* MIXMASTER
*Double Automatic* IRONMASTER
SILENT AUTOMATIC TOASTER
*Automatic* COFFEEMASTER
SHAVEMASTER
FLAT TOASTER • FAN HEATER
GLASS COFFEE MAKERS
WET-PROOF HEATING PAD
MASTER PLUG & CORD SET

MADE AND GUARANTEED BY
CHICAGO FLEXIBLE SHAFT COMPANY
5600 West Roosevelt Road, Chicago, Illinois
316 Commercial Street, Los Angeles, Calif.
224 S. W. Temple Street, Salt Lake City, Utah
557 Market Street, San Francisco, Calif.
50 YEARS MAKING QUALITY PRODUCTS

# 7 Important Improvements in LEAD SHEATHING






*The Hill Standpipe method of filling lead cylinder to obtain complete bonding of old and new charges; (a) the Standpipe in operating position; (c) control handles by which stream of new lead is directed against all portions of old charge.*

**Okonite-Callender paper cable sheaths are made by means of a new technique (the Hill Standpipe) from "stabilized" lead which retards oxidation during the sheathing operation. As a result they—**

1. **Have no flow lines.**
2. **Contain no "critical" region.**
3. **Are free from laminations.**
4. **Assure better bonding of crystals.**
5. **Will stand high pressures.**
6. **Will give improved service records.**
7. **Are uniform from end to end and around their entire circumference.**

**Full particulars, including test records and micro-photographs, will be promptly supplied on request.**

## THE OKONITE-CALLENDER CABLE CO., INC.

**PATERSON, NEW JERSEY**

New York Boston **AN AFFILIATE OF** **THE OKONITE CO.** Chicago Dallas

Seattle Buffalo **Executive Office: Passaic, New Jersey** Detroit Atlanta

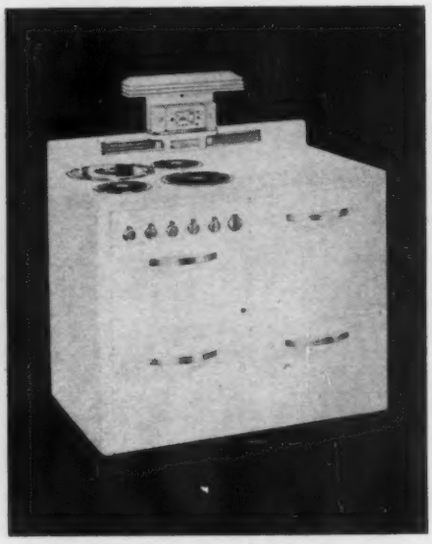
Philadelphia Los Angeles Pittsburgh Cleveland St. Louis Washington San Francisco

rotor; Scotch yoke compressor which is self-aligning to reduce friction; quietness of operation due to internal spring mounting; stainless steel evaporator which will not tarnish, chip or rust; Tel-a-Frost indicator; removable operator shelf for storage of bulky frozen foods, and quick ice trays.

Automatic control of humidity is provided in the G-E storage compartment, preventing food odors and shrinkage, while the new air filter freshens the air and maintains food palatability.

### Universal Electric Ranges

Five new Universal electric range models with several original and exclusive features were introduced to Landers, Frary & Clark salesmen at a recent group meeting. Chief feature of the new ranges is the "Mult-I-Heat" Control, a surface unit switch that dials over 101 different heats, making possible added flexibility of surface-cooking heat.



"Superheat" Speed units, "Magic Eye" Oven control, combining all controls in one and "Serv-A-Drawer," a novel thermostatic-


# More Profit on Every Job

When You Use BM TELESCOPE SYSTEM Connectors and Couplings

## THE SIMPLE METHOD!

*Here's Why—*

- Save 25% on material.
- Save 25% to 50% on time.
- Quick, easy, installations.
- Eliminate complications.
- Stronger, neater connections.
- No fussing with nuts to tighten.

**$1.35 Buys the One Tool Needed**

This one patented tool (1½" B.M. Indenter) handles 80% of all installations. Pays for itself many times over on the very first job.

*Approved by Underwriter's Laboratories*

*Distributed by:*

The M. B. Austin Co. Chicago, Ill.
Clifton Conduit Co. Jersey City, N. J.
Clayton Mark & Co. Evanston, Ill.
General Electric Co. Bridgeport, Conn.
The Steelduct Co. Youngstown, Ohio
Enameled Metals Co. Pittsburgh, Pa.
National Enameling & Mfg. Co. Pittsburgh, Pa.
Triangle Conduit & Cable Co. Elmhurst, New York City

**BRIEGEL METHOD TOOL CO. • Galva, Ill.**



*All Aboard for*

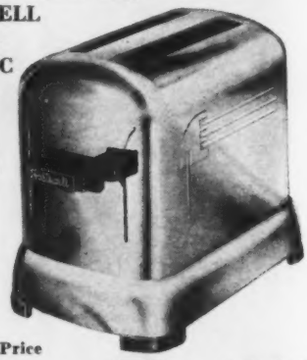
# TOASTSWELL'S

***BIG 1940 STREAMLINER DEAL***

**$1.00 TRADE-IN ALLOWANCE**

**On Each of These 3 Streamlined Toastswell Sales Record Breakers for a *Limited Time Only!***

**TOASTSWELL 2 SLICE AUTOMATIC TOASTER *with* SELECTIVE AUTOMATIC LIFT**



Regular List Price **$10.95** Special Trade-in Price **$9.95**

**TOASTSWELL**
**4 SLICE AUTOMATIC TOASTER with SELECTIVE AUTOMATIC LIFT**

Regular List Price **$15.00** Special Trade-in Price **$14.00**

**TOASTSWELL**
**AUTOMATIC WAFFLE BAKER**

Regular List Price **$9.95**

Special Trade-in Price **$8.95**

For 30 days beginning February 15th, 1940 Toastswell will allow a $1.00 trade-in allowance on any old toaster or waffle baker toward the purchase of either a 1940 streamlined 2 or 4 slice Toastswell Automatic Toaster or a 1940 streamlined Toastswell Automatic Waffle Baker.

Here's your chance to pile up the biggest Toaster and Waffle Baker month you have ever had, for everybody who sees these stunning streamlined Toastswell appliances selling at this special trade-in price will want one or more of them.

Act Now! This trade-in offer expires March 15th, 1940. so be sure to place your order with your jobber at once, or write us for complete information on this big deal and the rest of the great Toastswell line of appliances.

**UTILITY ELECTRIC CO.**
620 TOWER GROVE AVE., ST. LOUIS, MO.

ally-controlled warming compartment which keeps foods at serving temperature, are other features of the 1940 models.

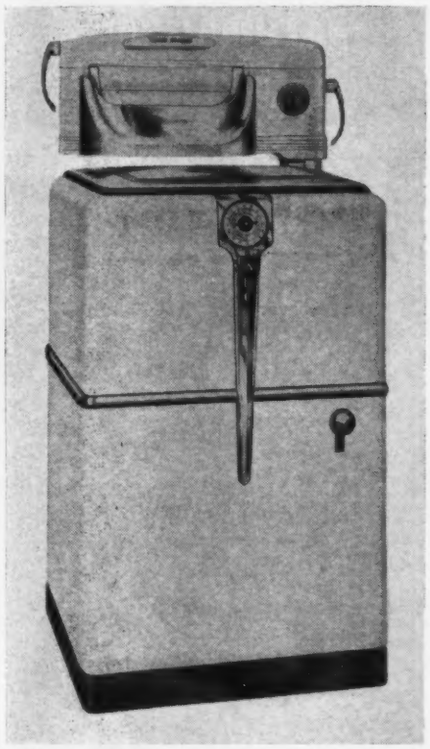
### Gibson Ranges

At four regional meetings held last month, the Gibson Electric Refrigerator Corp. presented their 1940 straight line of Kookall Electric ranges. Made up of five models which can be expanded into 20 different models by the dealer by use of three available sets of optional accessories, the Gibson line eliminates the need for a retail salesman to explain differences in structural design or oven sizes.

Every Gibson model, from the lowest to the highest priced, has the same basic one-piece, all-steel structure, and the same basic advantages for a complete cooking service. Every model is flush-to-floor and flush-to-wall with an all-porcelain exterior and an acid-resisting porcelain surface. All models have 5 cubic-ft. of storage space, 5 speed Chromalox surface elements, a slanting Eye-Angle instrument board, a pre-tested oven control and a 5 position smokeless broiler.

### Altorfer Washer

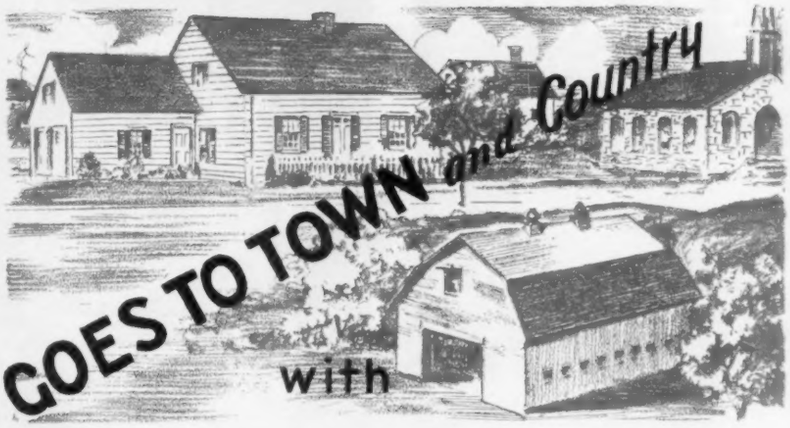
A washer that is at home in kitchen or laundry is the new ABC "400" cabinet washer presented by Altorfer Bros. New features include an automatic time control, which gives the operator complete control of all washing action; an exclusive crown, top-square washing compartment of porcelain; new six-wing tangent-vane cleansilator; new heavy-



duty wringer with triple-pressure selector and visible indicator; a six-way touch release with automatic-roll stop; polished aluminum drainboard; auto-type cleansilator control lever; and a lever for reversing wringer rolls and flipper drainboard.

### Hotpoint Refrigerators

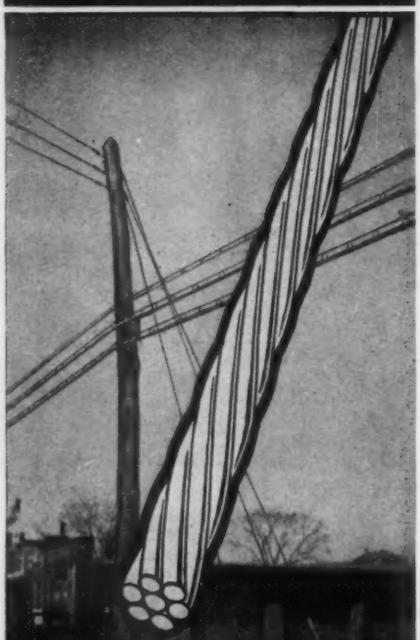
Hotpoint's fourteen refrigerator models for 1940 are presented in four groups—Imperial, Deluxe, Standard and Special. Each group provides a complete range of capacities to care for food storage requirements of all households. Imperial models include six,

RUBBER COVERED POWER CABLE • BUILDING WIRE
CRESCENT


CRESFLEX

NON-METALLIC SHEATHED CABLE
ADEQUATE WIRING SERVES AND SAVES
Step up your business volume and promote adequate wiring in farm communities as well as metropolitan areas—in homes, farm buildings and commercial properties. CRESFLEX gives an all-insulated wiring system that is the most suitable where a low resistance water pipe ground is not available. Its low cost, ease and speed of installation make it the MOST POPULAR R. E. A. WIRING MATERIAL.
CRESCENT INSULATED WIRE & CABLE CO. INC.
TRENTON, NEW JERSEY
WESTERN REPRESENTATIVES
LOS ANGELES Henger-Seltzer Co. 130 S. Hewitt St.
SAN FRANCISCO Hodges & Glomb 1264 Folsom St.
KANSAS CITY W. F. Howe & Co. 2627 McGee St.
CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE
VARNISHED CAMBRIC • FLEXIBLE CORDS • LEAD ENCASED AND PARKWAY CABLES • ARMORED CABLE
CRESCENT ENDURITE SUPER - AGING INSULATION

Crapo
GALVANIZED STEEL
STRAND
Guy and Messenger



ALL the STRENGTH and DURABILITY NEEDS DEMAND

The superior tensile strength that only steel can give . . . . the ruggedness to withstand severe punishment . . . . the ability to outlast normal needs . . . All these are combined—with outstanding economy—in *Crapo* Galvanized Guy and Messenger Strand.

Long life and low maintenance costs are characteristic of this time-tested product. Heavy, ductile, tightly-adherent zinc coatings, applied by the *Crapo* Process, provide lasting protection against corrosion. The inherent strength and endurance of the steel makes for dependable, maintenance-free service.

*Crapo* Galvanized Steel Strand is readily available in all standard grades and sizes from representative jobbers.

*Crapo* Galvanized Products also include *Crapo* HTC-130 and HTC-80 Steel Conductors (Solid and Stranded 3-Wire), Construction Wire, Tie Wire and Ground Wire.

INDIANA STEEL & WIRE CO.
MUNCIE INDIANA


eight, twelve and sixteen cubic-ft. models; Deluxe, five, six and eight cubic-ft. capacity; Standard models are three, five and six cubic-ft., and Special models, three, six and eight cubic-ft. capacities.

A new type Thermocraft insulation is used throughout the new Hotpoint refrigerator line. Hotpoint's five zones of cold provide for every type of freezing or food storage with the 1940 feature of Measured Humidity.

Pop Ice Trays are standard on all 1940 models, while new this year is the Hotpoint Air Purifier, mounted behind the Cold Storage compartment. This device prevents the circulation of any food odors which might be present in the cabinet. The vacuum-sealed Thriftmaster, equipped with a forced draft cooling, continues as the heart of the Hotpoint refrigerator.

### Hotpoint Ranges

"Measure Heat by Hotpoint" is the watchword for Hotpoint electric ranges in 1940. Five intensities of heat cover all surface operations and are obtained with greater speed and flexibility by reason of a completely redesigned Calrod unit. These new Five Heat, Select-a Heat Calrod surface units are standard equipment on every Hotpoint range.

A new Hi-Speed Thrift Cooker is also another Hotpoint contribution to electric cooking this year. This unit offers a new "High" heat for fast cooking, as well as a "Warm" and inter-


Business Men
BANK BY MAIL

Many out-of-town business men use our Bank-by-Mail Service for the advantages which this strong, metropolitan Bank affords. No matter where they live, this service is as convenient to them as the nearest mail box.

*Write today...*
for free Bank-by-Mail kit containing all necessary forms, return envelope and simple instructions.

CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO
California's Oldest National Bank

*Member Federal Deposit Insurance Corporation*

**PAINE *Improved* Cable Clamp**
For use on cross arms, overhead beams, etc. Paine patented slot permits rapid installation . . . no fumbling or guesswork . . . slip the bolt with the nut already on into the slot and tighten. Lag screw is gimlet pointed and securely riveted to the clamp . . . clamp is galvanized for rust and weather resistance.

**PAINE PIPE STRAP**
Prominent center rib adds extra strength, assuring maximum holding power. Uniform gauge materials, accurately punched. Snug, form fitting, and free from sharp ends and burrs. Packed in 5 and 25 lb. cartons and 50 or 100 lb. bags with 3% over weight to assure full measure.

ONE AND TWO HOLE ROMEX STRAPS

ROMEX STRAP
One and Two Hole straps for sheathed cable. Extra strength center rib, smoothly finished.

PIPE STRAP

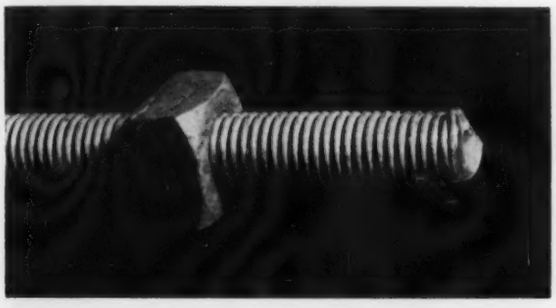
PAINE

THE PAINE COMPANY
2975 Carroll Ave. Chicago, Ill.
Western Warehouse and Sales in
Los Angeles, Seattle, San Francisco, Denver

# NEW!

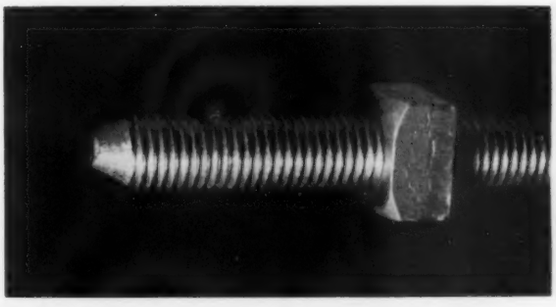
# "DRIVEPOINT" Bolts for Pole Line Use

## EASY TO INSTALL ----- EASY TO TAKE OUT

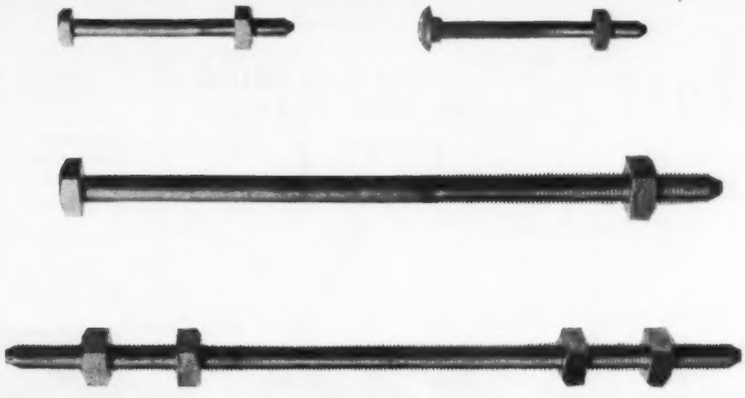


LEFT—Ordinary bolt after hammer has knocked it out of hole. Note broken threads.

RIGHT — "Drivepoint" bolt after hammer has knocked it out of hole. Effect of hammer on tapered point is negligible.



## Another Exclusive HUBBARD Development



The "Drivepoint" makes it easier to "find" the hole and drive the bolt in. Too, it simplifies starting the nut, guiding it into place without lost motion. When salvaging is done re-threading and re-galvanizing are eliminated with this new "Drivepoint" Cross Arm Bolt. For its specially designed, tapered point permits the lineman to hammer the bolt out of its hole without danger of smashing bolt threads. When a bolt must be re-threaded, it must be re-galvanized. Both of these expenses are wiped out by using this new Hubbard development.

The full thread double arming bolt with "Drivepoint" ends provides additional flexibility and increases salvage value.

This NEW feature lowers installation costs and reduces maintenance expense.

Specify Hubbard bolts for your pole line requirements and be assured of these outstanding advantages—available at your nearest branch of the General Electric Supply Corporation and the Graybar Electric Company.

**Hubbard and COMPANY**

OAKLAND, CAL. PITTSBURGH CHICAGO

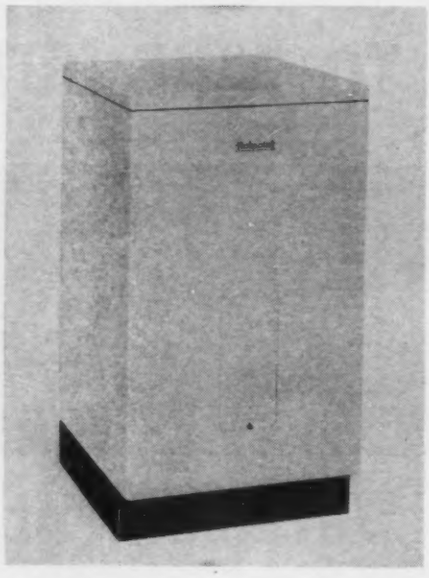
"HANG THE LOAD ON HUBBARD HARDWARE"

mediate heats. It has full six quarts capacity, bar-type handles, a double cover lid.

An additional innovation in Hotpoint ranges includes a new hydraulic type oven thermostat, which will maintain any oven temperature from 150 to 550 degrees F., on all Deluxe models. Brief cooking instructions are also permanently printed on the drip trays on all Deluxe Hotpoint ranges this year, where housewives can easily use them for reference.

### Hotpoint Water Heaters

Every model in the 1940 lines of Hotpoint electric water heaters has been restyled to meet the demands of modern families for beauty in every piece of household equipment, whether it is destined for installation in basement or kitchen. Hotpoint's 1940 electric water heaters include sizes for every home need, and for commercial use. They range from the 1 gal. size, and the 2 gal. "plug-in" Voguette, with its copper tank, to the large 140 gal. size for commercial use. The trouble-free Calrod immersion type heating unit is used in every Hotpoint electric water heater.



Hotpoint is also introducing this year an additional model of the table-top water heater for installation in all-electric kitchens. This particular unit is without a backsplasher, so that it may be installed wherever necessary in the kitchen without marring wall lines. The heater, as illustrated, has a 30 gal. capacity.

### Kelvinator Refrigerators

Backed by a revolutionary and far-reaching sales and pricing program, and featuring the new "Moist-Master" humidity system, the 1940 line of Kelvinator refrigerators was unveiled last month before distributors in Detroit. Price reductions ranging from $30 to $60 were announced by Frank R. Pierce, general sales manager.

Newest innovation in the Kelvinator line is the "Moist-Master" system, standard on three 1940 models—the HS-6 (6.00 cubic-ft.), HD-6 (6.1 cubic-ft.) and HD-8 (8 cubic-ft.). This new development is said to lengthen the period of time which foods can be kept in uncovered dishes. Temperature is held at about 45 degrees.

The "Five Big Sixes" feature the Kelvinator line, beginning with the SS-6, lowest priced model in the group at $119.95, shown here with Frank Pierce. It has a cabinet of welded steel, is finished in fine Permalux outside, and inside with a porcelain on steel lining, has a stainless steel freezer with a Finger-Tip Kelvin control, two extrafast freezing shelves and four fast-freezing trays.

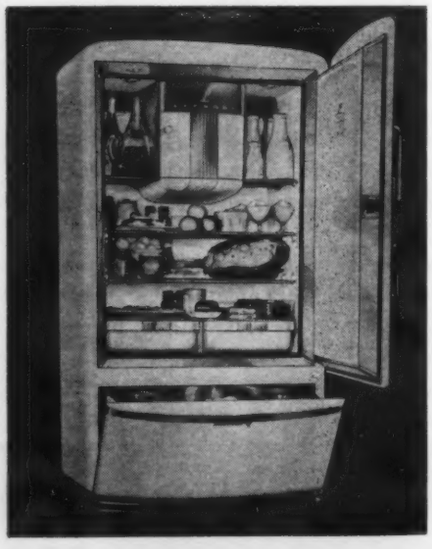
The three "Moist-Master" models are next in line, starting with lowest priced at $169.95. A rotating wheel-type Kelvin Cold Control controls this unit, which has 11.0 sq.-ft. of shelving and a 64 large cube capacity. Top member of the 1940 Kelvinator family is the HD-6, another of the new "Moist-Master" models. Priced at $209.95, it has a meat compartment built in the freezer, twin-sliding crispers with glass tops, and an advanced Kelvin control with an automatic return from defrosting. Shelf area is 14.4 sq.-ft.

Three 8 cubic-ft. jobs complete the series. Built for families who need large-sized cabinets for food storage, these "eights" range in price from $189.95 to $239.95, which is the price of the king of the Kelvinator line.

Standard on all 1940 Kelvinators is the Polarsphere, which is claimed to have not only an excess amount of surplus refrigerating power for hot weather and fast freezing, but enough refrigerating capacity to keep five refrigerators cold under average home conditions.

### Leonard Refrigerators

Lowest-priced in the company's history, the 1940 line of Leonard refrigerators, which includes five "sixes" and three "eights" has a new "Hi-Humid" system of controlled humid-




**CUT THE COST OF CONDUIT BENDING AND PIPE PUSHING**

*With Greenlee Hydraulic Tools*

**Hydraulic Conduit and Pipe Benders**

Much time and money can be saved by using Greenlee Hydraulic Tools for bending conduit and pipe. Not only do they do the work faster, but they make a better job of it with much less effort on the part of the workmen. They are simple to operate and easy to take to the job. No. 770, shown to the right, bends all sizes of conduit from 1¼" to 3". The larger size, No. 775, bends all sizes from 3" to 4½". Attachments can be furnished for thin-wall steel conduit.

Ask Now for COMPLETE DETAILS

**Hydraulic Pipe Pusher**

With this hydraulic pusher, one man can stand in a comfortable position and send pipe under streets, sidewalks, lawns, etc., simply by pumping the handles. It saves money and makes it unnecessary to do extensive trenching. Because of its compact design and simple construction, it is easy to set up and move about. Capacity for pipe up to 4".

**Greenlee Tool Co., 1703 Columbia Ave., Rockford, Ill.**

*Every house needs*
**Westinghouse**

# PACEMAKERS.. FASTER FOR '40!

*Complete New*
**WESTINGHOUSE RANGE LINE**
**with the STAND-OUT FEATURE OF THE YEAR!**

NEW

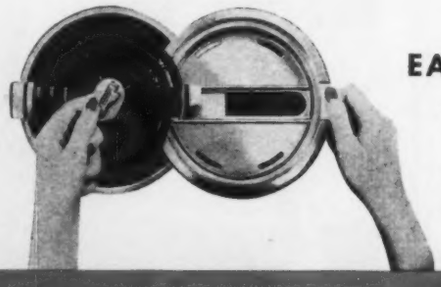
## SPECTACULAR NEW MODELS DESIGNED TO SELL *FASTER IN '40!*

Every one of the 8 beautiful new models in the 1940 Westinghouse Range line is "tops" in its price class —every one is a big bargain value in modern cooking convenience. And advanced styling plus sensational new features open the way to a quick-profit selling pace that's "Faster for '40!"

See your Westinghouse Distributor or write Dept. 88, Westinghouse Electric & Mfg. Co., Mansfield, O. *today* for full details.

**5-SPEED COROX**
**HEATS 30% FASTER**
**USES 22% LESS CURRENT THAN EVER BEFORE!**

**5 SPEEDS** on every Corox on every model in the 1940 Westinghouse line!



**EASIER TO CLEAN!**

Exclusive new, one-piece pan easily and completely removable for quick, thorough cleaning.

# Westinghouse PACEMAKER Ranges

*"The Line of Least Resistance"*

ity. Providing the exact amount of moisture for maintaining original freshness in foods for longer periods of time in uncovered dishes, it offers buyers a completely new type of refrigeration.

The LSS-6 is the 1940 Leonard line leader at $119.95. Offering a full 6.25 cubic-ft. capacity and 11.5 sq.-ft. of shelf area, the unit is large enough to hold a week's supply of food for an average family. It is furnished in fine Permalain, and powered by the silent Glacier sealed unit.

Third in the line of eights, and the reigning member of the Leonard family, is the LHD-8, shown here. Priced at $239.95, this unit is a "Hi-Humid" Leonard, with its meat and freezing compartments built as one unit and fully enclosed by a door. Shelving totals 15.9 sq.-ft., and cube capacity is 108 cubes at a freezing.

### Norge Refrigerators

More usable and accessible food storage space—as much as 14.4% more in some models, has been built into the 1940 Norge Rollator refrigerators. This extra interior space and 42 improvements and refinements are the features of the new Norge models.

The extra storage space was made possible, according to Norge officials, by the simplicity and compactness of the Norge Rollator compressor, permitting the vertical lengthening of the food compartment, and the addition of an extra shelf in most models.

Included is a "Cellaret," a ventilated, non-refrigerated reserve storage compartment for packaged foods and bottled goods below the cold-storage compartment.

The 1940 Norge is presented in four series; three models in the Supreme series; three in the Deluxe; two in the Monogram and four in the Viking group. These range from rated capacities of three to eight cubic-ft.

### Westinghouse Ranges

Westinghouse revealed last month a new five-speed Corox unit, which engineers say are 30% faster and use 22% less current in cooking operations than Corox units of other years. This unit shared honors with the "True-Temp" oven—an oven with uniform heat throughout.

For twelve years Westinghouse has been working with steel company engineers on the development of an alloy that will give electric surface units greater speed and durability. The result of this long research is Silicoy—a high nickel chromium Silicon alloy. This is used as sheathing material in the five-speed Corox unit. High in heat resistance, it also is extremely efficient in heat transfer.

Single dial control, a feature of the 1940 Westinghouse range oven, is designed to make manual operation as simple as possible. One turn of the dial operates both heaters and sets the temperature for pre-heating and baking or broiling. Balanced heat is achieved through a new hydraulic thermostat and improved oven heat evener, which directs the side-to-side heat flow.

### Westinghouse Refrigerators

"Tru-Zone Cold," a definite temperature in each of five food-keeping zones in Westinghouse refrigerators, is a new exclusive feature of the company's 1940 line. Made possible by the combination of Westinghouse Tru-Temp control, fiberglass insulation and other mechanical features, this feature will give housewives complete control of temperature and humidity.

The new line consists of three Aristocrat models which are also available in the Emperor line with porcelain finish. Two Hostess models are manufactured for the medium income group, and four special models, of which two are three and four cubic-ft. models for multiple dwelling sales.

A noteworthy addition is an eight cubic-ft. model that sells for less than $200. Improvements in the other Westinghouse models include Fiberglas insulation in all units; streamlining of interiors in chrome trim; improved sealing qualities.


"It's the Best Ever"—

The *Nicopress* Method of Splicing and Dead-Ending . . .

For security — strength — and economy the Nicopress method of splicing and Dead-Ending is "tops" from every angle.

Offset Dead-End Sleeve — Illustration Shows Dead-End Installed on Conductor.

The outstanding advantages secured through the use of Nicopress sleeves and tools are:

- Simplicity of installation.
- All completed Nicopress Splices equal or exceed rated breaking strength of conductors.
- Absolutely no slipping of conductor.
- The remarkable degree to which NICOPRESS Completed Splices and Dead-Ends withstand vibration.
- In case of Dead-Ends, the provision for a tail of any desired length.
- The fact that both splices and Dead-Ends are made with the same tool. Nicopress tools are light, compact and extremely easy to operate.

In the complete range of NICOPRESS Sleeves and Dead-Ends you will find the exact type and size best suited to your requirements. Write for Price List R-34.

*Nicopress Splicing Sleeve and Completed Splice*

THE NATIONAL TELEPHONE SUPPLY CO.

5100 Superior Ave., Cleveland, O.

Canadian Mfr.—N. Slater Co., Ltd., Hamilton, Ont.

Export Distributor—International Standard Electric Corp., New York, N. Y.

# QUALITY OF PERFORMANCE COUNTS

In the early days of vaudeville when an actor didn't meet the approval of the audience there were cries of "Get the Hook"; and sometimes hooks did appear from the wings. Quality of performance counted then as it counts now—in the theatre and everywhere else. Certainly the performance given by electrical wiring installed today should be good.

## G-E MATERIALS FOR ALL TYPES OF JOBS

Therefore, you'll please your customers by using G-E Wiring Materials. The quality of their performance can be depended upon. G-E Conduit, Wiring Devices and Wire and Cable are carefully designed to be used together and to give good service indefinitely. Only first grade raw materials are used in their manufacture. The line includes materials for wiring all types of buildings—residential, commercial, industrial and institutional.

## G-E HOME WIRING PROVIDES ADEQUACY

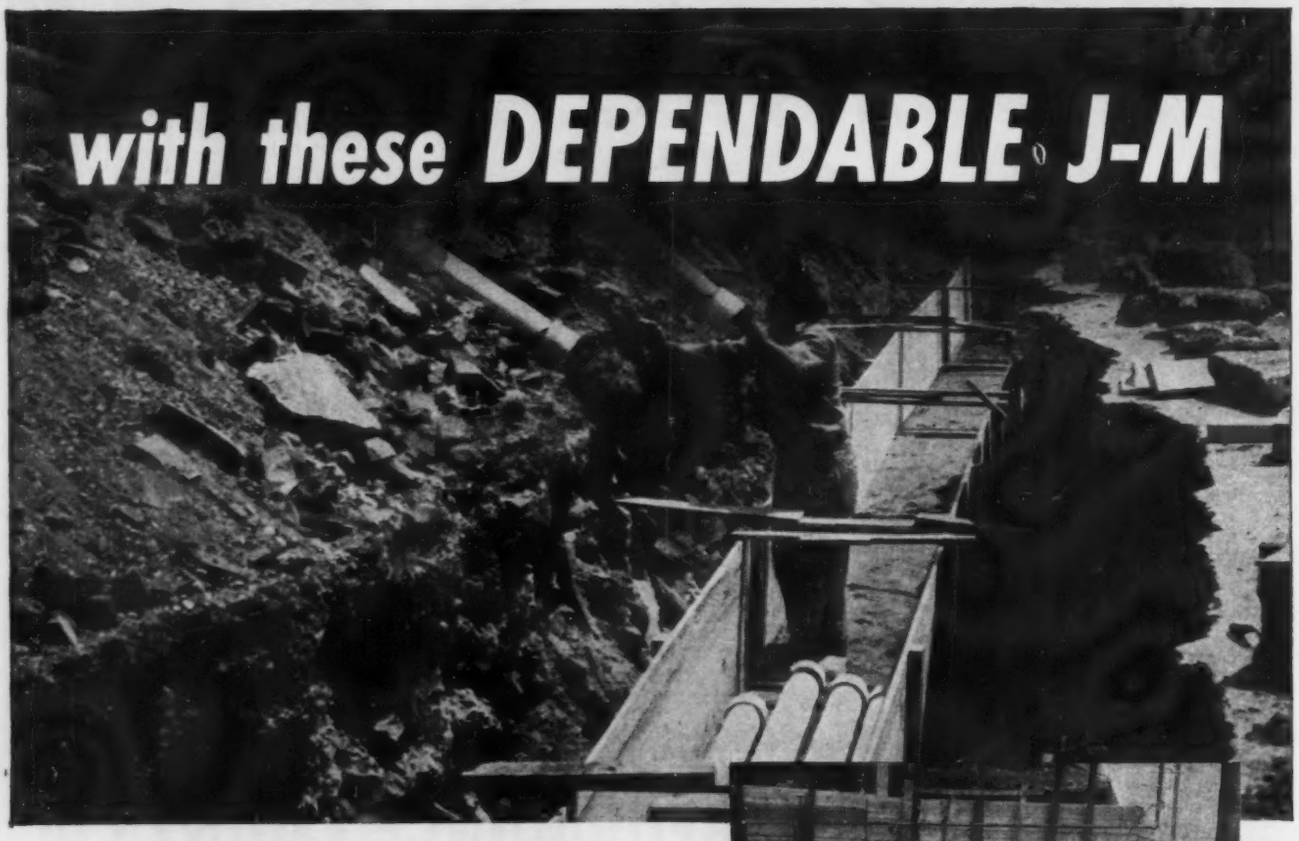
For contractors who are interested in wiring homes, General Electric has developed a modern wiring method called G-E Home Wiring that will provide the electrical adequacy home owners want today.

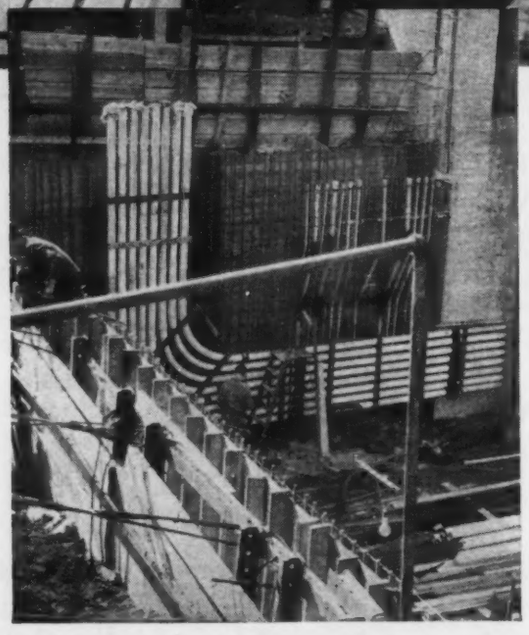
For further information about G-E Wiring Materials or G-E Home Wiring, see the nearest G-E Merchandise Distributor or write to Section CDW-0232, Appliance and Merchandise Department, Bridgeport, Connecticut.

**GENERAL ELECTRIC**

# DISTRIBUTE POWER

## with these DEPENDABLE J-M





### TRANSITE DUCTS SAVE IN ANY LOCATION

**You get every advantage necessary for lowest cost distribution systems when you use J-M Transite Conduit and Transite Korduct. Their mineral, asbestos-cement composition reduces fire losses and smoke damage when burnouts occur . . . minimizes maintenance even under severe soil and weather conditions. Transite Ducts dissipate heat rapidly . . . reduce $I^2R$ losses. Permanently smooth bores permit easy cable pulls. And Transite Ducts are supplied in long, light lengths that keep installation costs low.**

**Underground or in exposed locations, Transite Conduit eliminates the entire expense of "concreting-in". . . holds its true form under sustained loads without a protective casing. But when jobs call for concrete, you save with Transite Korduct . . . thinner walled, lower priced, yet equally permanent. For details, send for brochure D. S. 410.**

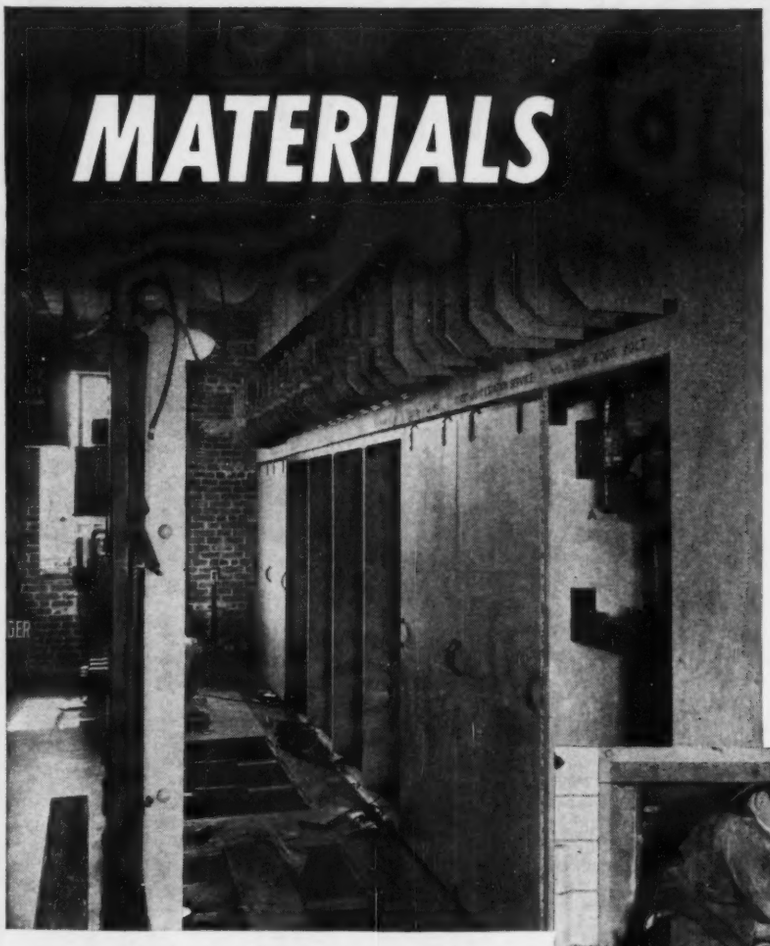
JOHNS-MANVILLE JM PRODUCTS

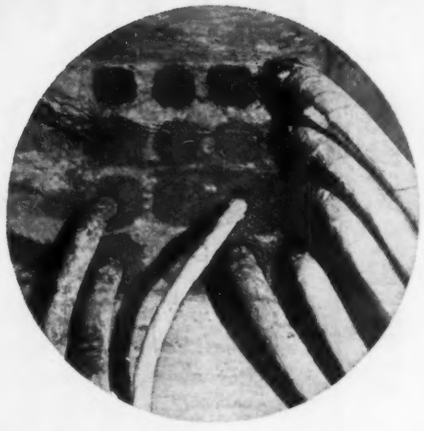
# JOHNS-MANVILLE

TRANSITE CONDUIT...TRANSITE KORDUCT...

# FOR *LESS* MONEY...

## MATERIALS





### PERMANENT SEALS FOR DUCT OPENINGS

Easily worked and handled, Duxseal is a plastic, non-hardening putty that forms a lasting tight seal. Unaffected by temperature changes or liquids and gases commonly found in underground cableway structures. Adheres firmly to any duct or metal surface.

### BETTER CELL STRUCTURES COST LESS

Check Trancell's advantages for cell structures and doors: Compared with metal, Trancell greatly reduces condensation troubles. An asbestos product, it cannot rust . . . never requires shutdowns for cleaning or painting. Being fireproof, it confines oil fires to the cells in which they occur, and its low heat conductivity minimizes damage to adjacent equipment. Compared with concrete, Trancell's light-weight sheets are easily, rapidly erected without water. Floor loading is minimized, permitting construction savings. Brochure D.S. 426 gives full details.

### INCOMBUSTIBLE CABLE PROTECTION

Here's an unusually effective cable fireproofing with a long record of dependable service—J-M Niagrite-Asbestoment. It is easy to apply . . . shields cables from excessive heat . . . needs less maintenance. In case of arcing, it prevents damage to adjacent cables and equipment.

**For details on how these J-M Electrical Products help you improve service and save money, address Johns-Manville, 22 East 40th Street, New York, N.Y.**

# ELECTRICAL PRODUCTS

**TRANCELL . . . DUXSEAL . . . NIAGRITE-ASBESTOMENT**

**$6285 DOLLARS SAVED THE FIRST YEAR**

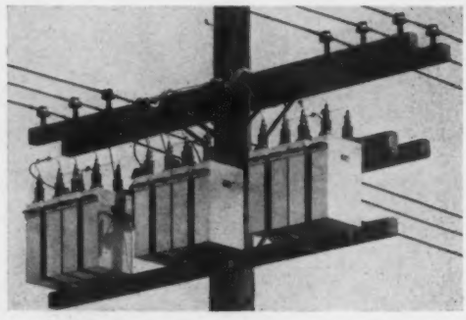
**SMALLER LINE LOADS . . BETTER VOLTAGE REGULATION . . REDUCED POWER BILL . .**

# UTILITY SAVES $6285 IN YEAR...

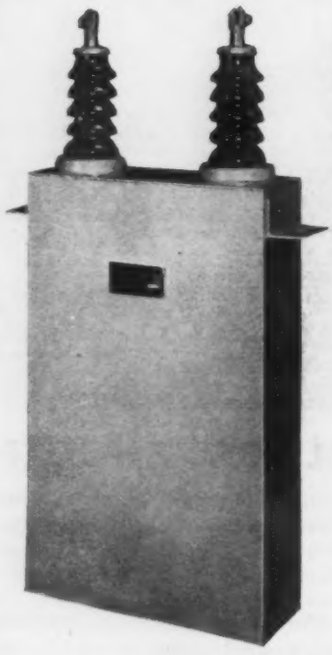
**POWER FACTOR CORRECTION CAPACITORS PAY FOR THEMSELVES IN LESS THAN TWO YEARS**

After 22 months of satisfactory service, a California Public Utility reports that their capacitor installation, manufactured by JOHN E. FAST & COMPANY, has raised their power factor to 95% or better and netted them an average monthly saving of over $500.00

THIS IS TYPICAL OF THE SAVINGS POSSIBLE WITH "FAST" CAPACITOR INSTALLATIONS. LET OUR REPRESENTATIVE CHECK YOUR CORRECTION NEEDS. HE CAN SHOW YOU HOW TO SAVE MONEY.



*180 kva 2300 volt Capacitor Bank*



*15 kva 2300 volt Pole Type Unit*

In addition to direct money savings, power factor correction equipment raises the voltage of the system, relieves overloaded lines and transformers, permits additional KW loads to be carried with the same distribution system.

The JOHN E. FAST & COMPANY capacitor is the finest unit of its kind. The windings are designed to allow thorough impregnation and adequate cooling. The impregnating liquid used has the best electrical characteristics and stability of all commercial dielectrics.

The active elements are enclosed in a heavy, acetylene welded steel container, HOT TINNED INSIDE AND OUT, for special protection against rigid climates. The unit is finished with three coats of weatherproof paint.

**John E. Fast & Co.**

*Established 1919*

**3123 NORTH CRAWFORD AVENUE CHICAGO, ILLINOIS**

**West Coast Representatives:**
**WALTHAM, DE WITT & KRUSI, 630-632 Monadnock Building, San Francisco, California**

**LOWER LOSSES . . . . HIGH STABILITY . . . . HOT TINNED CONTAINER**

**THE FINEST POLE TYPE CAPACITOR MADE . .**

INSULATION DIVISION

*Corning Glass Works*

# ANNOUNCES A NEW-ZONE PRICING SYSTEM

**Under this plan, agents quote standard delivered prices to any community within each zone—another progressive step in the trend toward Pyrex brand insulators.**

**SEE YOUR NEAREST AGENT OR WRITE DIRECT FOR FULL DETAILS**

Mr. Paul Berry
814 Braniff Bldg.
Oklahoma City, Okla.

Mr. H. C. Biglin
138 Marietta St.
Atlanta, Ga.

Bra Bon Electric Co., Inc.
Lewis Tower Bldg.
Philadelphia, Pa.

Braisted & Bair
744 New Center Bldg.
Detroit, Mich.

Continental Sales & Engineering Co.
304 Koppers Bldg.
Pittsburgh, Pa.

R. D. Cope & Co.
Allen Building
Dallas, Texas

A. D. Fishel Co.
942 Engineers Bldg.
Cleveland, Ohio

The Galigher Co.
228-232 S.W. Temple St.
Salt Lake City, Utah.

Mr. L. B. Graves
808 LaSalle Ave.
Minneapolis, Minn.

George Hamburger Co.
226 Cooper Bldg.
Denver, Colorado

George E. Honn Co.
420 Market St.
San Francisco, Calif.

W. D. Howze Sales Co.
422 Alpine St.
Los Angeles, Calif.

N. M. Mintz and Associates
40th St. and Calumet Ave.
Chicago, Ill.

Mr. J. E. Nelson
424 Peoples Bank Bldg.
Indianapolis, Ind.

Mr. Henry Nixon
5701 Wornall Road
Kansas City, Mo.

Mr. J. E. Redmond
448 W. Madison St.
Phoenix, Arizona

Mr. D. D. Schneider
82 Kenyon Bldg.
Louisville, Ky.

Mr. Howard D. Steele
79 Cambridge St.
Boston, Mass.

Mr. E. A. Thornwell
217 Whitehall St., S.W.
Atlanta, Ga.

Mr. H. T. Wharton
69 Humber Trail
Toronto, Ontario

Mr. T. S. Wood
220-222 Ninth Ave., N.
Seattle, Wash.

**CORNING GLASS WORKS, CORNING, N. Y.**

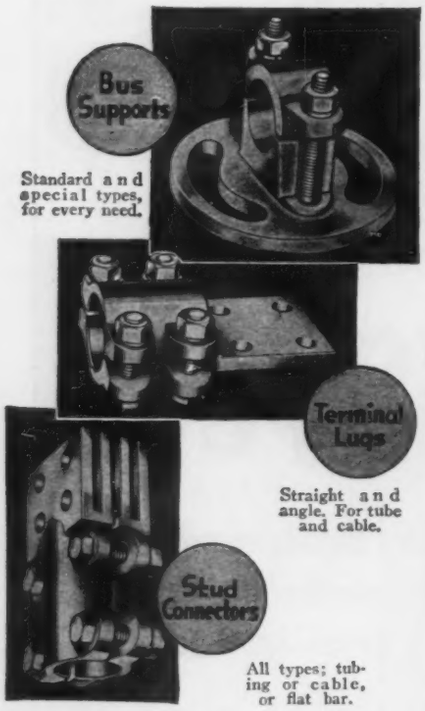
CORNING *means* Research in Glass

*Pyrex Insulators*
BRAND

**Preferred** *because they are* **Dependable**

The leading utility companies and "industrials" use PENN-UNION fittings to make certain of *dependable* connections.

They know that *every* Penn-Union fitting is carefully designed and manufactured . . . thoroughly tested.


Bus Supports
Standard and special types, for every need.
Terminal Lugs
Straight and angle. For tube and cable.
Stud Connectors
All types; tubing or cable, or flat bar.

These fittings are high conductivity copper alloy, with machined contact surfaces.

**More than 6,200 items** in the Penn-Union line . . . for every type of electrical connection . . . including many NEW and IMPROVED fittings. Write for Catalog.

**NICHOLAS & COOK**
1063 HOWARD STREET
SAN FRANCISCO

**J. W. WATKINS**
538 SKINNER BLDG.
SEATTLE

PENN-UNION ELECTRIC CORP., Erie, Pa.

**You'll find it in the *complete* line**

**PENN-UNION**
Conductor Fittings

The refrigerant used in the Westinghouse refrigerator is "Freon," which permits lower temperatures and faster freezing, and is safer under all conditions. Vibration and noise have been reduced by cushion mounting of the mechanism. A "built-in watchman" protects the motor against thermal overloads and outside line disturbances. This shuts off the motor when danger threatens, and turns it on again when the danger has passed.

## Frigidaire Refrigerators

Sweeping improvements in economy, utility, operation and appearance, which include the introduction of color, together with a revision of lines that offers a broader coverage of the consumer field, are the developments introduced in 1940 Frigidaire electric refrigerators.

Meter-Misers, the Frigidaire rotary compressor, continue to represent efficient, low operating cost in Frigidaire models. Cold Wall type of refrigeration has been retained, and its use has been expanded into several other lines.

The "dew fresh seal" glass shelf, which acts as a seal between the upper and lower compartments, now is equipped with a humidity control permitting the amount of humidity in the Cold Wall section to be regulated as desired.

Improvements in all 1940 cabinets include

a door that opens flush with the inside wall. This facilitates use of sliding shelves and hydrators. Door handles this year are massive, with a chrome finish.

New popular size models in the lower-priced "Super Value" line have been added. A total of 16 models is offered in standard and Cold Wall series. They range from a Table Top 3 cubic-ft. size to a Cold Wall Imperial Porcelain 12.5 cubic-ft. unit.

The Quickcube tray and grid, an enlarged heavy glass cold storage tray are standard equipment in the Super Value and Master lines. Basic price structure for the entire line remains virtually unchanged.

## Frigidaire Ranges

More convenience for the user, plus a wider choice of models, top the features of the 1940 Frigidaire electric range line. One of the new ranges added is a deluxe model incorporating two ovens. Including two combination ranges, there now are 10 models in the group.

The "Thrifto-matic" control which permits the user to set the switch at "high" for any period up to 30 minutes with heat automatically turned to "low" at the moment indicated, was formerly only used with the deep well cooker. The 1940 models introduce, for the first time, an automatic control of this type to be used in conjunction with a surface heating unit.

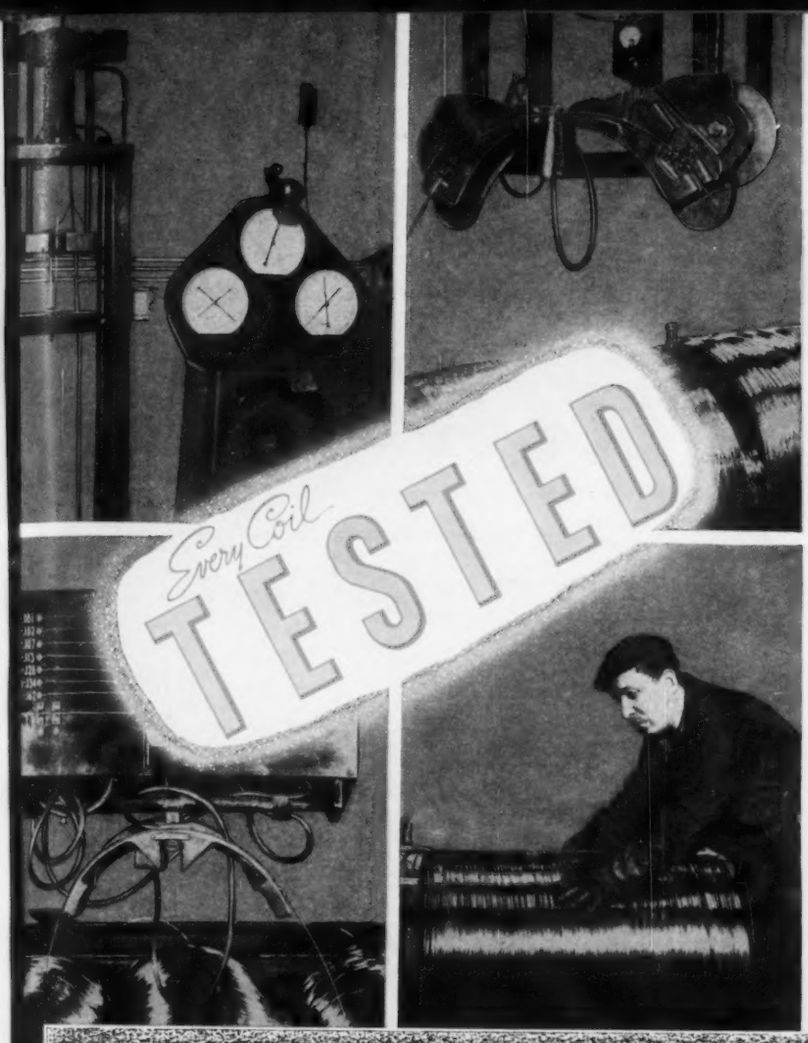
An innovation to the entire Frigidaire deluxe line of electric ranges is a "Cook-Master" time control of different design than the type previously used. It consists of a clock and two concentric rings which are adjusted for commencement and ending of cooking time.

An additional new feature is the "Simpli-Matic" single dial oven control which eliminates the need for manual adjustment from pre-heat to baking temperatures. Exceptional beauty of design is stressed throughout the entire line, each model having a one-piece steel cabinet with full porcelain finish.

**IT HAPPENS EVERY DAY**

Shipments from the East leave daily for the West via *NATIONAL* fast, regular, dependable through service . . . combining truck and rail under one responsibility from source to your door.

**NATIONAL**
CARLOADING CORPORATION
FAST FREIGHT
OFFICES IN PRINCIPAL CITIES



## EVERY COIL* OF COPPERWELD WIRE MUST PASS THESE 9 EXACTING TESTS:—

1. **DIAMETER** — determined at both ends and middle of every coil.

2. **SURFACE INSPECTION** — The surface of every coil of Copperweld wire is inspected for smoothness and freedom from surface imperfections not consistent with the best commercial practice.

3. **BREAKING LOAD**—Every coil tested. Wire used in strand tested before stranding.

4. **ELONGATION**—Every coil tested. Elongation in ten inches must not be less than 1½%.

5. **BEND TEST** — Made on pieces from both ends of every coil—is indicative of ductility of both steel and copper.

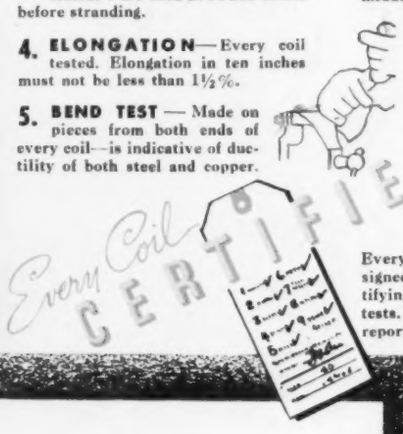
6. **WELD TEST**—Pieces of wire from both ends of every coil broken in the bend test are carefully examined at the break. There must be no separation of copper from steel.

7. **KINK TEST**—Made on pieces from both ends of every coil to guard against seams, laps and other exterior imperfections. It likewise tests the ductility of the metals.

8. **CONDUCTIVITY** — Every coil is tested at both ends and the middle on a special instrument.

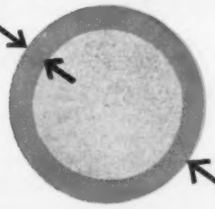
9. **COPPER THICKNESS** — The special equipment shown, actually measures the thickness of copper on both ends of every coil.

*Wire used in strand tested before stranding.




Every coil is numbered, and this tag signed by the inspector is attached, certifying that the coil has passed the nine tests. Detailed individual inspection reports are kept on file.

## Guaranteed COPPER THICKNESS



The minimum thickness of copper shall not be less than 12½% of the wire radius for 40% conductivity wire, and not less than 10% of the wire radius for 30% conductivity wire.

## Guaranteed RUST-RESISTING LIFE OF SOLID COPPER

The thickness and continuity of the copper covering will be such that the material will have a life, insofar as corrosion is concerned, similar to that of an all-copper wire of the same size, used under similar exposure conditions.

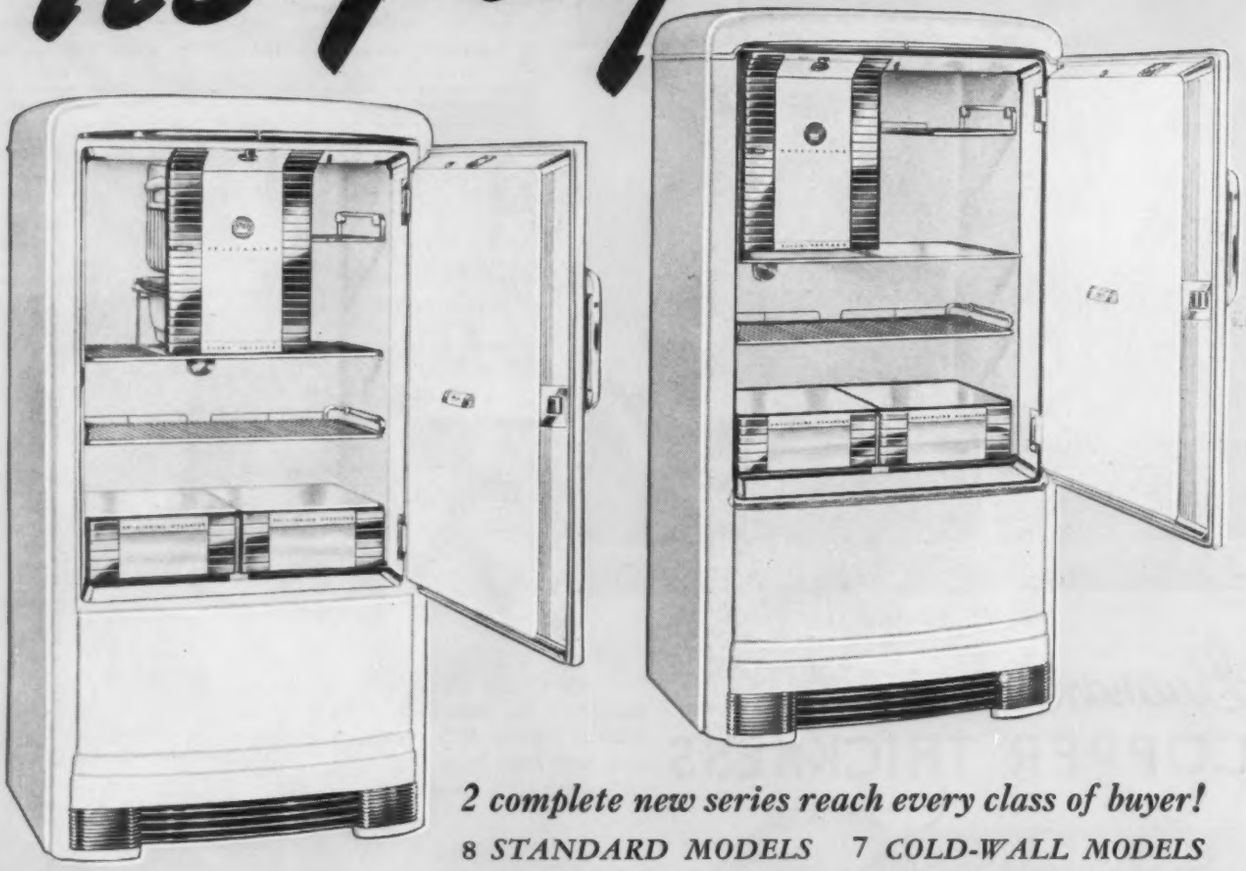
*Pacific Coast Representative:* C. E. INGALLS · Rialto Building · San Francisco, California




# COPPERWELD
## WIRE AND STRAND

COPPERWELD STEEL CO. Glassport, Pa.

# It's Frigidaire



## *2 complete new series reach every class of buyer!*

### 8 *STANDARD MODELS*

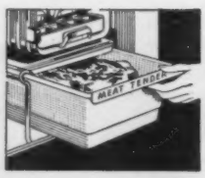
**Setting new high standards of value—with such de luxe features as stainless chromium shelves and Quickube Trays in *every* model, from highest to lowest in price. No other make refrigerator offers so many truly valuable selling advantages!**

### 7 *COLD-WALL MODELS*

**The finest refrigerators money can buy. Newly improved. Offer at new low prices the revolutionary Cold-Wall Principle that has been proved, in the homes of thousands, to be the most sensational refrigeration development since the first Frigidaire.**

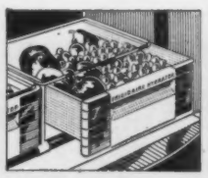
## *FRIGIDAIRE IS A Better Buy!*

**Double-Easy Quickube Trays** come loose and cubes pop out instantly. No hacking, no melting under faucet. Greatest ice convenience ever offered—*in every tray in every 1940 model.*



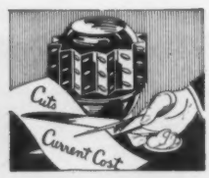

**Extra-Large Meat Tender** slides out like a drawer. Saves food dollars every month by properly protecting all kinds of fresh meat and fowl. Also stores 100% extra supply of ice cubes.

**New Stainless Chromium Shelves** dramatize the beauty of Frigidaire interiors with bright, gleaming, mirror-smooth luster. Rustless and sanitary. Stay new for years. Cleaned in a jiffy. Another Frigidaire First! —*In every 1940 model.*



**Glass-Topped Food Hydrators** guard freshness of fruits, vegetables, other perishables so amazingly you can actually see dewy moisture on the glass covers. Preserve color, flavor, days longer.

**One-Piece Steel Cabinet** built to last a generation, seals in the insulation and prevents "water-logging" that destroys cold-keeping efficiency. Easiest of all cabinets to keep clean.




**Meter-Miser** . . . simplest cold-making mechanism ever built. Self-oiling, self-cooling. Silent, efficient—uses even less current than ever before. Exclusive F-114 Refrigerant—safest ever known.

# for '40!

FRIGIDAIRE

## NEW Design and Color Harmony! NEW Convenience Features! NEW Low Prices!

### *America's No. 1 Refrigerator Leads Again!*

● Does it have "that golden touch"? There isn't a single doubt!

It's big, it's beautiful, it's a bargain, this glamorous new Frigidaire. A stunning creation of master craftsmanship and engineering skill.

Eye-capturing is the cabinet exterior of rich new beauty . . . clean, appealing design! And what a picture inside! An artist's genius come to life! An exquisite color harmony of bright blue, dazzling white and glittering gold! Shining stainless chromium shelves . . . a new, extra-large Meat-Tender . . . Glass-Topped Hydrators! A jewel-like interior of convenience that will delight every woman who sees it!

And the beauty and value are more than meet the eye. Deep in the heart of this sturdy, one-piece steel cabinet, is the Meter-Miser, further improved for 1940...quietly and efficiently keeping food safer and freezing ice faster at *the lowest current cost in Frigidaire history!*

Yes, the new 1940 Frigidaire Refrigerator, backed with far-reaching and thorough selling support of all kinds, is as "good as gold" in the pockets of Frigidaire selling men. No wonder that, from coast to coast, the news is out: "It's Frigidaire for '40!"

## *Sensation of the Industry—*
# New Frigidaire Electric Range

*Extra-Fast! • Extra-Sure! • Extra-Thrifty!*

● Nine beautiful 1940 models include a new top-quality range equipped with two ovens . . . a traffic-building, sensationally low-priced cabinet model...and a new combination electric range and kitchen heater.

New features include a **New Simpli-Matic Oven Control** that provides super-fast pre-heating, then *automatically* switches to proper baking temperature...a **Thrifto-Matic Switch** on the rear surface unit and Thermizer well-cooker that *automatically* turns from high to low heat when desired . . . **New Signal Lights** that glow whenever any surface or oven heat is turned on . . . and efficient **Cooking-Top Lamp** on every household model.

We say with confidence that, with its many selling advantages, the new 1940 Frigidaire Electric Range will exceed the sales and profit expectations of every Frigidaire selling man!

### *New 1940*
### FRIGIDAIRE ELECTRIC WATER HEATERS

● The Frigidaire Water Heater line now includes a handsome "Super-Value" model selling at the lowest price ever placed on a Frigidaire Electric Water Heater. Opens up great new sales opportunities. There are also beautiful new De Luxe Cabinet models, and a trim Table Top model (36" high).

**FRIGIDAIRE DIVISION • GENERAL MOTORS SALES CORPORATION • DAYTON, OHIO**

# NEW PRODUCTS

## Pantographic Machine (201)

A bench type pantographic machine for general industrial engraving work on all materials, and electric etching on soft or hardened steel, is presented by H. P. Preis Engraving Machine Co. Separate heads quickly interchangeable, are used for the two classes of work. On engraving work, depth of cut is controlled, independent of the depth of master characters, by a micrometer adjustment mechanism on the engraving head. An electrical transformer provides three or more voltage stages for various depths of marking.

## Panelboards (202)

New oil-immersed panelboards, using thermal trip branch circuit breakers, for the protection of lighting circuits in locations exposed to corrosive elements and explosion hazards, have been introduced by Westinghouse. The new breaker has a compensating bimetal mounted outside the chamber of the breaker frame in which the main tripping bimetal is enclosed. This is affected only by the general temperature of the whole tank of oil. Its motion is transmitted to the tripping bimetal through a link, thermally and electrically insulating the two members and passing through a small clearance opening in the breaker wall.

## Condensers (203)

With capacities ranging from two to 50 tons, 16 new models of evaporative condensers have been developed by the air conditioning and commercial refrigeration department of General Electric at Bloomfield, N. J. The two to five-ton units are of the propeller-fan type and are arranged for either floor or ceiling mounting, while the larger sizes utilize centrifugal fans and can be installed either indoors or out.

## Clevises (204)

Adding to its line of spools and insulated clevises, the Ohio Brass Co. has introduced a 3" spool and a clevis assembly using this spool insulator. The spool itself is suitable for secondary racks. The clevis assembly is for dead-ending secondaries and neutral conductors, turning angles, and filling various other requirements. Made of wet-process porcelain, the spool has high electrical and mechanical values. The clevis is made of steel, hot-dip galvanized.

## Insulators (205)

A new line of switch and bus insulators has been introduced by Porcelain Products, Inc. These insulators are assembled with an asphaltic compound known as "Permalastic," which is permanently elastic. It has

a high softening point, and high elasticity at low temperatures. All units are available with either radio-interference treated or standard glaze.

## Control Switch (206)

Originally designed for oil circuit breaker operation, the improved type "M" control switch, manufactured by Delta-Star Electric Co., has expanded its field to many other applications. The right-left, push-pull rotor movements and unit construction with Bakelite housing offer a device with almost unlimited possibilities for circuit control, instrument transfer and signalling.

## Cross Arm Bolt (207)

A new cross arm bolt with a tapered point has just been introduced by Hubbard & Co. The "Drivepoint" makes it easier to find the hole and drive the bolt in. It also simplifies starting the nut, guiding it into place without lost motion. When salvaging is done, this new bolt eliminates re-threading and re-galvanizing. It permits the lineman to hammer the bolt out of the cross arm without danger of smashing bolt threads. When a bolt is re-threaded, it must be re-galvanized. These costs are no longer necessary with the "Drivepoint" bolt. Hubbard has a complete line of cross arm bolts with "Drivepoint" ends, including the full thread double arming bolt which provides additional flexibility and increase salvage value.

## Gravity Feed Oilers (208)

A new line of visible gravity feed oilers, modernized, streamlined and with unbreakable reservoirs, has been developed by the Trico Fuse Mfg. Co. The oiler illustrated is 50% lighter in weight and there are no gaskets to leak as the unbreakable bottle is cemented and roll-clinched to the heavy brass base. All metal parts are bright cadmium-plated for beauty and easy cleaning. Comes in three styles, in 1, 2, 4, and 8 oz. capacities.

★ *For Quick Service on Quality Products from Local Stocks*

*Get in Touch with:* **GEO. E. HONN CO.**

420 MARKET ST. SAN FRANCISCO, CAL.

MANUFACTURER'S REPRESENTATIVE FOR:

PYREX INSULATORS, POWER AND RADIO
Corning Glass Works
FUSES, RESISTORS, MOUNTINGS, CUTOUTS, FUSE LINKS, DISCONNECTS, BUS SUPPORTS
Schweitzer & Conrad Inc.
CAPACITORS
Cornell-Dubilier Corp.
CURRENT TRANSFORMERS, NIAGARA AIR INSULATED
Lee Skipwith Company
CABLE GRIPS
Kellems Products, Inc.
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOIST
Jasper Blackburn Products Corp.
GUY WIRE PROTECTORS, CONE ANCHORS, EARTH AUGERS
The Specialty Device Co.
GROUND LINE POLE AND GREEN WOOD TREATMENT
Osmose Wood Preserving Company
TONG TEST AMMETERS—LOW VOLTAGE GENERATORS
Columbia Electric Mfg. Co.
UNDERGROUND CABLE TOOLS & EQUIPMENT
T. J. Cope, Inc.
TREE TRIMMING EQUIPMENT
TREE SURGEONS' TOOLS
Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES
Clifton Manufacturing Co.
METER JEWELS
Herman D. Steel Company
SAFETY LINE TOOLS
Burnham Line Tool Company

**Stocks at San Francisco**
Electrical Specialty Co., Inc.,
316 Eleventh Street

**Stocks at Los Angeles**
Electrical Specialty Co. of So. Calif.,
451 South San Pedro Street

**Stocks at Seattle**
Electrical Specialty Co., Inc.,
714 Fourth Avenue

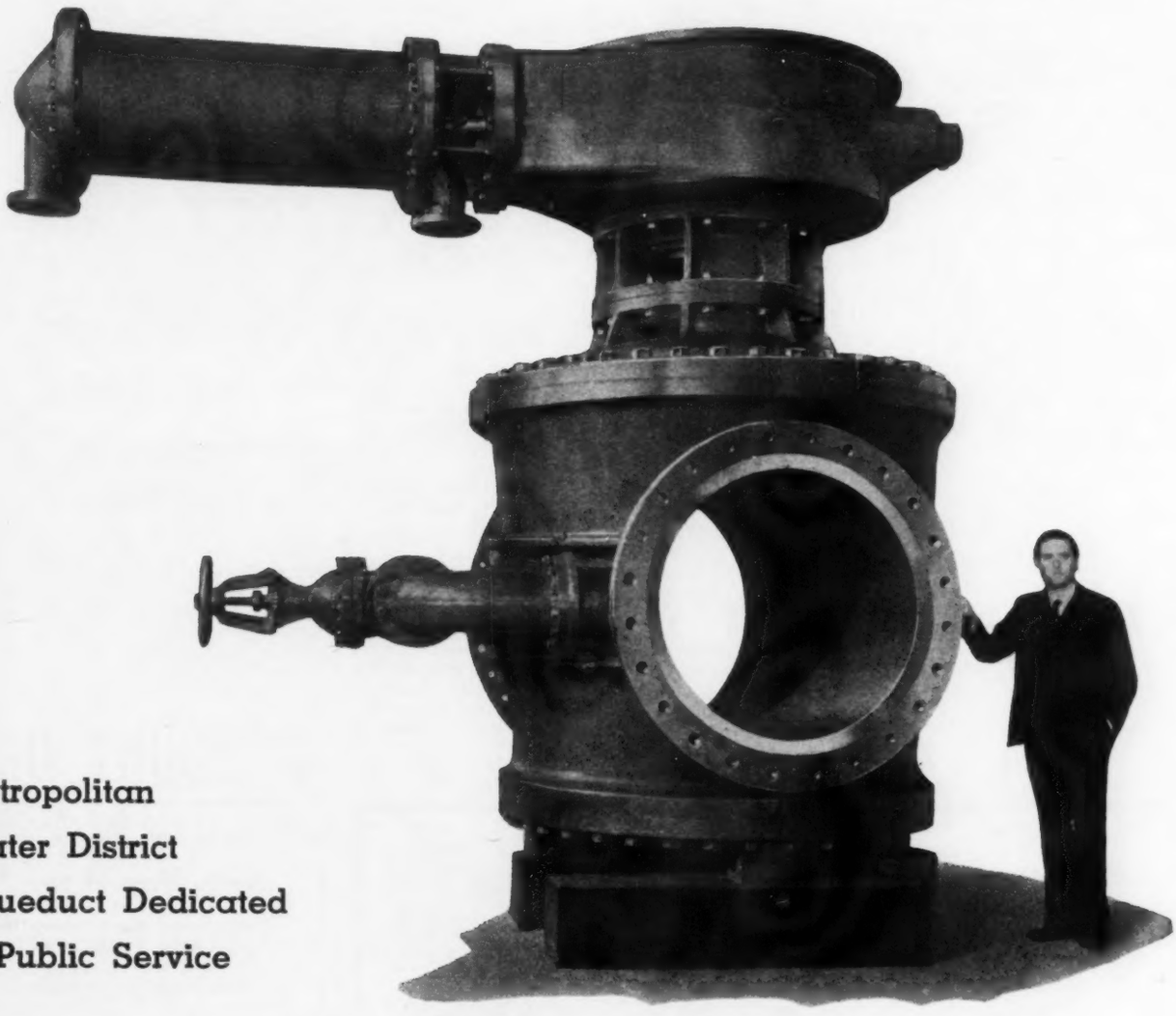
*For the Coast Trade*

At your doorstep you now have an adequate stock of popular D-H alloys, wires, ribbons, rods and other forms.

**Driver-Harris Company**
Harrison, N. J.

TRADE MARK REG. U.S. PAT. OFF.
Nichrome

# Great Water Project Completed



**Metropolitan Water District Aqueduct Dedicated to Public Service**

**Hydraulic equipment of unprecedented size and capacity will soon begin operation as Colorado River water enters the 280-mile flow line for ultimate distribution in Southern California. Of particular interest to the hydraulic engineer are six automatic cone type valves built by Pelton engineers in collaboration with the Chapman Valve Mfg. Co. and installed in the Eagle Mountain and Hayfield pumping stations. Six booster pumps at Intake and Gene stations were also furnished jointly by the engineering and manufacturing facilities of Pelton and Byron-Jackson. Details will be given upon request.**

## THE PELTON WATER WHEEL COMPANY

**HYDRAULIC ENGINEERS**

| 120 Broadway | 2929 Nineteenth Street | Paschall Station |
|---|---|---|
| New York | San Francisco | Philadelphia |

**EXCLUSIVE WESTERN REPRESENTATIVES for Baldwin-Southwark Division of Baldwin Locomotive Works, De La Vergne Engine Co., Woodward Governor Co., Cone Valve Division, Chapman Valve Mfg. Co. and Carbondale Division, Worthington Pump & Machinery Corp.**

# PELTON

### Controlens (209)

An in-bilt no-box, controlens, designed to provide "built-in" lighting, is presented by the Holophane Co., Inc. Combined with a prismatic reflector, it gives more useful ft.-candles, and being of glass, the light controlling surfaces suffer no permanent depreciation. With Controlens, light is transmitted without the aid of obstrusive fins, louvers, control rings.

### Transfer Switch (210)

An automatic transfer switch, spring gravity drop-out type, for automatically connecting a lighting or power load to an emergency source in case of failure, is now being manufactured by the Zenith Electric Co. The unit is available in one, two, three and four pole construction, for a.c. to a.c.; a.c. to d.c.; d.c. to d.c. or d.c. to a.c. Current capacities range from 30 to 300 amp. Contacts are copper to copper and they operate with a rolling and wiping action.

### Multi-breaker (211)

At the lowest cost ever obtained on a circuit breaker device, a new 15-, 20- or 25-amp. multi-breaker has been introduced by Westinghouse. This new device has many applications in every industrial plant, for a small, inexpensive switching device with overload protection; in the small home or cottage, as a service or load center for lighting and appliances; on the farm, for feed grinders, milking machines; and by utilities on connection with water heaters, small ranges, and other high-wattage appliances.

### Fan-cooled Design (212)

An enclosed, fan-cooled design, with ball bearings, has been developed by the Reliance Electric & Engineering Co., making it possible for them to build explosion proof d.c. motors as large as 75 hp. Recent changes and improvements now enable the company to provide a complete range of sizes from 1 hp. up to 75, all of them tested and approved by the Underwriters' Laboratories, Inc. for Class 1 Group D hazardous locations.

### Gang Unit (213)

For 3-wire systems, a new gang unit of 3-wire plug outlet and red jewel pilot light shows at a glance when current in outlet is being consumed. Unit manufactured by Arrow-Hart & Hegeman Electric Co., is complete with .060″ Brush Brass plate and ruby jewel. Receptacle and plate may be ordered separately so that plates may be attached after interior finish is completed.

### Repeat Cycle Timer (214)

Latest new type of precision control equipment is the repeat cycle timer, designed for use on a.c. circuits to alternately close and open one or two circuits continuously at any present operating interval, and to close or open a single circuit after any preset operating interval and stop, ready to repeat its cycle of operation upon reclosure of a starting switch. This timer, developed by the R. W. Cramer Co. has a wide variety of uses—to control automatically the duration of operation of electrically operated machinery, processes, etc.

### Across-the-line Starter (215)

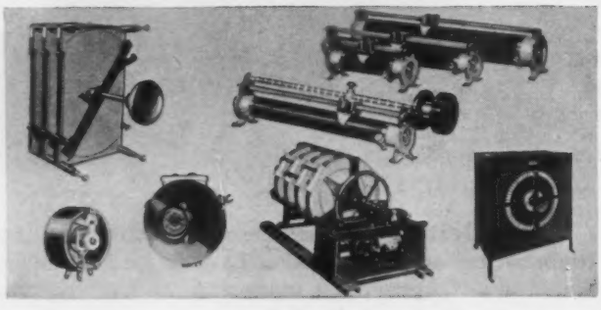
A new, small and inexpensive across-the-line starter for ratings up to two h.p., 220, 440 and 550 volts, two- and three-phase and equivalent ratings on single-phase, has been announced by Westinghouse. They are used for across-the-line starting of squirrel-cage induction motors, and as primary switches for wound-rotor induction motors. Typical applications include machine tools, conveyors and pumps.

### Angle Socket (216)

The National Electric Products Corp. have recently added to their "Plug-in" Strip line a new angle socket, with an accurate factory-made 6″ spacing that guarantees uniformity and eliminates careful measurement. Lumiline, tubular and standard shaped lamps may be interchangeably used and lighting arrangements changed at will. The unit will accommodate standard lamps from 15 to 100 watts, inclusive.

## PRODUCT DATA

*Send for Bulletins*



**A RHEOSTAT LINE THAT IS COMPLETE**

**The bulletins on Ward Leonard Rheostats are probably the most complete compilation of Rheostat data ever assembled by a single manufacturer. Besides types and ratings the subjects of manual and motor drives, mountings and accessories are completely covered. Send for a complete set of the latest Ward Leonard Rheostat Bulletins.**

**WARD LEONARD ELECTRIC COMPANY**

48 SOUTH STREET MOUNT VERNON, N. Y.

*Electric Controls Since 1892*



***Keep Posted for 1c***

**Your being right up-to-the-minute may have an important bearing on your success. New developments are appearing daily in your field—tools to help you do a better job. Are you abreast of them? You fall back a step when the other fellow is well informed about a subject of which you are ignorant. Manufacturers' publications are a quick, efficient way for you to keep posted on current events in your field.**

**Isn't it a bargain to invest 1c (the cost of a postcard) to help earning power to which you look forward? American industry is offering a remarkable service—free. ELECTRICAL WEST makes it easy for you to enjoy this service for your own. Check and mail the coupon below. That's all you have to do to help yourself toward better performance and greater rewards.**


### Switch Gear (217)

Metal-clad switch gear for indoor service is the subject of a new publication by the Roller-Smith Co. It shows application and advantages over other forms of construction such as vertical panel switchboards or cubicles with fixed breakers.

# WAGNER DISTRIBUTION TRANSFORMERS for Every Type of Service ——

No matter how varied your requirements may be, the Wagner line of distribution transformers will meet those requirements. Wagner distribution transformers range from the small 100-va air-cooled transformer to the large sub-station type, and the same high quality goes into the construction of each one.

Every Wagner transformer has the benefit of nearly 50 years of transformer engineering experience... experience in building all types of transformers. The value of this experience is demonstrated by the actual performance of Wagner transformers in service. In all parts of the country Wagner transformers are hanging up records for continuity of service. From the complete Wagner line of distribution transformers you can select just the type to meet your requirements. Specify Wagner on your next request for quotation.

Rural-Line

Small Primary Pocket-Stud Type

Stud-Bushing Type

Sub-Station Type

Large Primary-Pocket-Stud Type

In addition to the complete line of distribution transformers Wagner builds power transformers in all sizes and ratings. For complete descriptive literature on the design and construction of Wagner transformers, write for Bulletins 180 (Distribution) and 181 (Power).

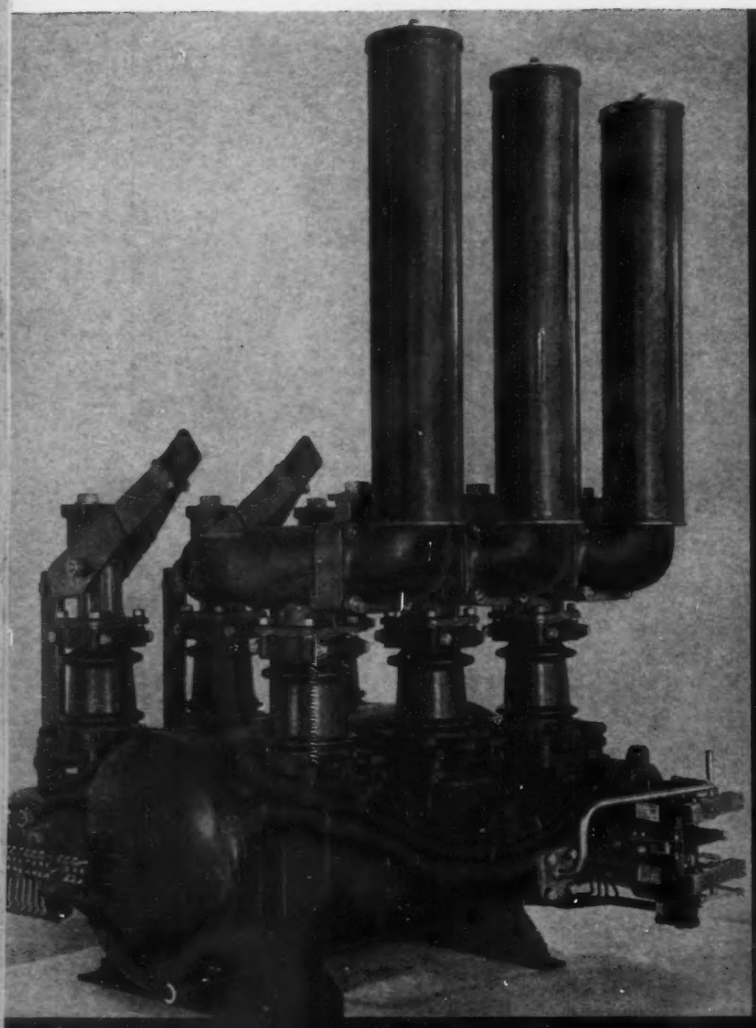
T 40-2

## Wagner Electric Corporation

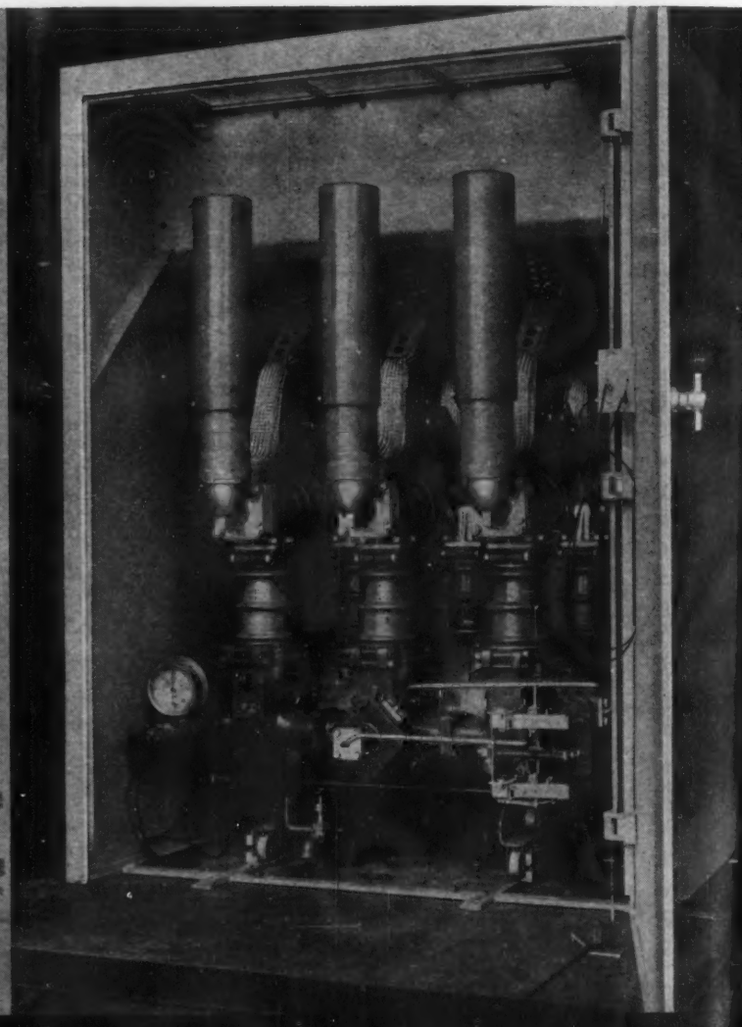
6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

TRANSFORMERS • MOTORS • FANS • BRAKES

# ANNOUNCING



250,000 KVA, 15,000 VOLT ALLIS-CHALMERS INDOOR Air Blast Circuit Breaker for application in cells, cubicles and metal-clad switchgear.



TESTING AN INDOOR AIR BLAST CIRCUIT breaker in the high voltage laboratory. Breaker rated 1200 amp, 15 kv, interrupting capacity 500,000 kva.

*Over 90 Years of Engineering Superiority Work for You When You Specify Allis-Chalmers!*

ALLIS-CHALMERS A-C MILWAUKEE

SALT LAKE CITY, UTAH — KEARNS BUILDING
LOS ANGELES, CAL. — ROWAN BUILDING
PORTLAND, OREGON — 1311 S. E. UNION AVE.
SAN FRANCISCO, CAL. — RIALTO BUILDING
PHOENIX, ARIZONA — LUHRS TOWER
SEATTLE, WASH. — HENRY BUILDING
DENVER, COLORADO — CONTINENTAL OIL BUILDING

# ...THE NEW ALLIS-CHALMERS AIR BLAST CIRCUIT BREAKERS!

Climaxing several years of exhaustive research and testing . . . paralleled by field trial installations . . . Allis-Chalmers now offers indoor Air Blast Circuit Breakers for cell, cubicle and metal-clad mounting.

The Allis-Chalmers Air Blast Breaker makes its debut . . . but only after Allis-Chalmers engineers have proved its ability to deliver satisfactory service under the most arduous demands of American power systems.

With the introduction of the air blast breaker, new fields in circuit protection are open. By using the pre-stored energy of compressed air for the two-fold function of contact operation and circuit interruption, a guillotine-like form of arc interruption has been attained . . . giving you shorter interrupting and arcing times . . . longer contact life!

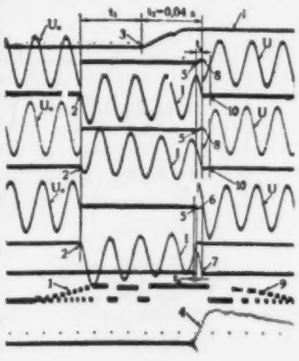
**Get Added Protection!**

The Allis-Chalmers Air Blast Circuit Breaker operates independent of the rate of rise of recovery voltage. Now you can control this factor that has always been a system trouble-maker . . . get added protection for your system!

Indoor breakers will shortly be available for 150,000 and 250,000 kva at 15,000 volts and 500,000 kva with 23,000 volt insulation for operation at 15,000 volts. Larger sizes and higher voltages will follow.

Find out how you can get improved system stability...recovery voltage control . . . circuit protection and safety of operation with the new Allis-Chalmers Air Blast Circuit Breaker! For the complete story on air blast breakers, call the district office near you or write direct to Allis-Chalmers, Milwaukee.

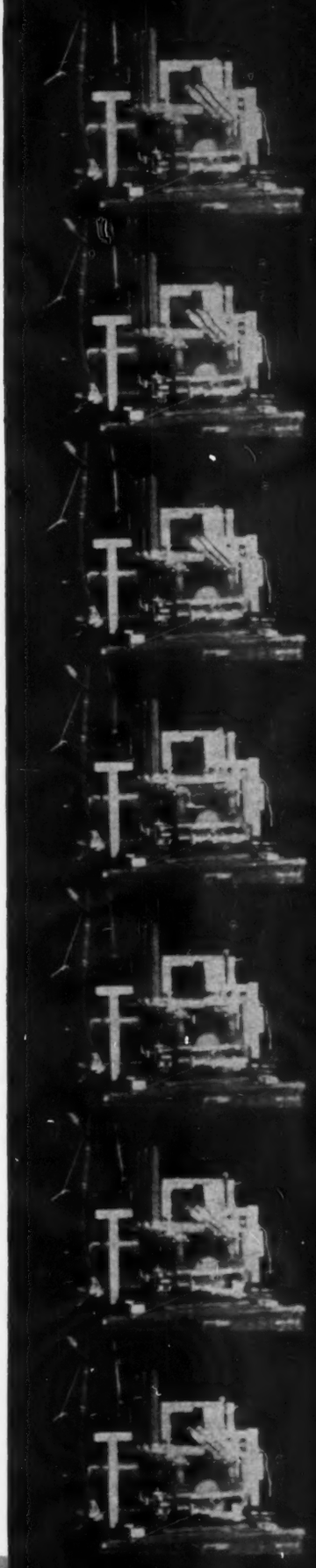
**Oscillographic Test Record of Air Blast Breaker Interrupting 43,000 Amperes at 8100 Volts.**



(1) disconnect contacts close; (2) short starts; (3) trip coil energized; (4) air pressure (135 or 225 lb) rises in interrupting chamber; (5) contacts separate; (6) point of interruption of current in first phase interrupted; (7) point of interruption of current through resistor in first phase interrupted; (8) interruption of shorts in phases 2 and 3; (9) disconnect contacts open; (10) point of interruption of current through resistors in phases 2 and 3.

$t_1$=relay time; $t_2$=interrupting time; $t_3$=arcing time, first phase interrupted; $t_4$=arcing time, second and third phases interrupted; i=breaker coil trip current; U=voltage; I=short-circuit current.

A-1167

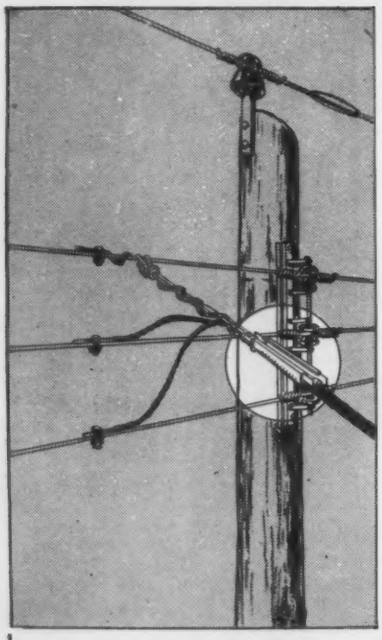


MOVING PICTURE RECord of 250,000 kva Allis-Chalmers Air Blast Circuit Breaker closing the short circuit and interrupting 13,200 amperes at 11 kv during test.

**ALLIS-CHALMERS**

MILWAUKEE·WISCONSIN

modernize
YOUR
DISTRIBUTION
PRACTICE—



Residential area construction—showing single phase primary with attachment of service cable a couple of feet from pole to high strength common neutral wire.

RELIABLE
CONCENTRIC
CABLE CLAMPS

hold cable securely without bending or snubbing or otherwise damaging the insulation. Non-corrosive materials—easy to install — low in cost.

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE • CHICAGO, ILLINOIS

## Portable Tools (218)

Covering its entire line of Portable Electric Tools, the Black & Decker Mfg. Co. presents its 1940 catalog. Particular attention is called to two greatly improved drills, the ½" and ¼" "Junior" drills. Sixty-two pages include every possible kind of portable electric tool from drills to valve refacers. Illustrations are accompanied by complete details of each unit.

## Repainting Transformers (219)

Repainting Transformers in the Field is the title of a new G-E bulletin which is full of information about surface preparation and the practical methods of sandblasting, wire brushing and chemical removers. The method of applying paint is described, together with number of coats required, materials recommended for repainting outdoor transformers and repainting underground equipment.

## Fluorescent Units (220)

A bulletin by the Pittsburgh Reflector Co. illustrates the company's new fluorescent lighting equipment, shows installation methods and how units are assembled. A few applications are sketched and tables give various single and double units according to lamp sizes, approximate weight, and retail prices.

## L & N Instruments (221)

A 66-page condensed catalog, just issued, lists the entire Leeds & Northrup line of instruments for research and for routine testing in laboratory, plant and field, such as Standards, Galvanometers, Dynamometers, Bridges, Potentiometers, Photometric Apparatus, Primary Elements, accessories, supplies and instrument parts. Principal items are illustrated. Workers in laboratory, field or plant will find this publication a useful guide.

## Time-Switches (222)

A complete line of time-switches are featured in a new Sangamo Electric Co. catalog just issued. Detailed description of the synchronous motor, synchronous motor with carryover, and electrically wound time-switches, in conventional and socket type enclosing cases is included. Complete a. c. and d. c. ratings with contact specifications are also listed, as are astronomic dial, two-circuit, duplex, and outdoor time-switches.

## Varmeter (223)

Electrostatic Varmeter for measuring reactive volt-amperes on transmission or distribution circuits without cutting the conductors is the subject of a bulletin released by G-E. Seven illustrated pages tell about construction, operation, dimensions, price.

## Lightning Arrester (224)

In simple, thorough style, G-E's bulletin on Thyrite lightning arrester covers design and application of station-type (Form E) equipments. Protective characteristics are charted, most all applications illustrated. Drawings and tables present ratings, installation data, prices.

## Demand Meters (225)

A good fundamentals pamphlet on meters is G-E's bulletin on demand meters. It illustrates the various pieces of equipment and includes five pages of text on how to select demand meters.

# SAVE TIME! USE THIS COUPON

**To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:**

ELECTRICAL WEST, 68 Post St., San Francisco, California
Please send me the following CIRCLED items:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 |
| 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 |
| 219 | 220 | 221 | 222 | 223 | 224 | 225 | | |

Name..... Title*.....

Company* .....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

# Are You Wiring Small Homes?

New Type MO
Multi-breakeR

☆ This new Square D Multi-breakeR provides service entrance with two 15, 20 or 25 ampere lighting circuits and 35 ampere mains capacity. Each circuit is independently switched and individually calibrated. It eliminates fuses—a movement of a lever restores the circuit. Built with either surface or flush mounting. The list price is only $2.65.

There are larger Multi-breakeRs for every type of building. See your Square D distributor or write for bulletin CA-543.

**CALL IN A SQUARE D MAN**

**SQUARE D COMPANY**

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

# ELECTRA'S HUSBAND

## *Down on the Farm*

IT IS always a treat to sit lazily before the fire and indulge in a speculative flight into philosophy. A book is a good starting point, but after all a book is second hand. So when Carl came down for a visit from the backwoods it was more than a treat. He's the kind that we can send Electra off to a show or let her sit quietly and knit while we take the world apart and put it back together a little nearer to the heart's desire.

"The other day," he mused aloud, "the manager of the retail units of a national chain store system located just outside our service area was in one of our district offices asking for help in locating some *good* salesmen. In the sparsely populated area like ours there are openings for outside salesmen with some of the best retail establishments, both independent and chain."

"You mean to say there isn't an unemployment problem?" I asked in mock horror.

"Nope. There's a problem of getting good men." Then he went on. "In the twenty-odd years I have been wandering around in this world, attempting to make a living, it has become increasingly apparent to me that it takes some of the finest assorted, first quality guts to keep punching doorbells for sales, successfully, over a term of years, to say nothing about the brains necessary.

"Every town in our territory with a population of about 700 or over has merchants who want one or more outside salesmen. Most of these men would be hard put to do the job they want these salesmen to do. Many might feel the work beneath their alleged dignity."

"It isn't only in salesmen that good men are needed," I put in. "There's a firm doing some big contracts for the government in the Pacific islands, and I've looked in vain for men to recommend to them for important estimating and engineering jobs."

"Yes, I know, but salesmen are something else. They are even exempt from those statutes that pull the work hours down to 42 per week. Makes me wonder if this isn't a new slant on the meaning of the word salesman. Seems to me we have other laws in which salesmen were also exempted."

"Well," I was curious to know, "what's the difficulty? Aren't salesmen treated right in the small towns, or do they have the big city fever so bad they won't stay? Salesmen, the born kind, seem to like the bright lights."

"Perhaps that's it," thought Carl. "Yet many years ago I caught the farm fever. Must have one, must be independent, be an agriculturalist—with a capital I. So I moved out. My nearest neighbor was a man who had been a farmer all his life, boy and man. He was a good farmer and a fine neighbor. He had no trouble getting good farm hands and keeping them."

"How so?"

"Men liked to work for him. He had no palatial home. He had none of these labor-saving devices such as electricity and gasoline engines provide today, yet he had no trouble keeping farm help. He paid reasonable wages to good men, and when he had a good year he paid them a little more than he had agreed to pay them when he hired them. He never asked them to work on commission and then turned them loose with the work animals and farm machinery.

"He helped his men by passing on to them some of his knowledge of and with farming. They made him more profit on the wages he paid because of these things. He helped them to be better workmen for him and then gave them substantial proof that he appreciated good men.

"There was a peculiar thing about this farmer-friend of mine. He sometimes praised men who worked for him that other farmers vowed and declared were not worth a cuss."

We were silent for some minutes thinking over this homely truth and regretting, I suspect, that there were so few like his farmer-friend. Finally he continued, as though back on the original thought:

"An individual or firm, if properly financed or with sufficient credit, assembles the finest values in electrical equipment, in the best location, in a dream of a show-room and with the latest in show window design. But his problem of making money is just started. He, or the folks he hires, must convince Mr. and Mrs. America that they need the things he has to sell."

From her corner Electra, who should have been minding her own knitting, had to have her last word.

"If there is a dearth of *good* sales people — and what I could tell you about that—

"Don't get started, Electra, please"—

"Well, if good sales people are so scarce, instead of all this high blood pressure of sales training and meetings and hoopla, wouldn't it be better if the owners, the managers and sales executives did some real thinking to see if they could not be more like that farmer?"

What's the use. There's no answering a woman.

"CAN'T say that I blame the contractors so much," I confessed to Electra a few night later.

"Why the sympathetic mood?" she queried. "I had the impression that, like a lot of others in the industry, you needed somebody to blame for things and contractors were always convenient to kick around."

"Maybe so. From the way they are kicked around by the public, the inspectors, the general contractors and the industry in general, I suppose it gets to be a habit. Like a kid kicking a tin can on the way to school. He doesn't know why but it must feel good.

"Heard a prize one today. Good thing the contractor was Irish and had a sense of humor. Some months ago a man asked this contractor to give him a figure on the wiring for a range and furnishing the range too. The chap, he thought, was his friend so he gave him a very considerate estimate and was put off. Nothing more was heard until today when the man came in again to ask for a favor. He certainly had a cast-iron crust. What he wanted was very simple. He had bought the range wholesale somewhere. Then he had bought some wiring materials from a chain store and wired it in himself. Now all he wanted was for the contractor to secure an inspection permit for the job, take it down to the utility and collect the $30 wiring allowance from the power company. The superchiseler!"

"I suppose you'd call that 'consumer cooperative.'" Electra wisecracked.

"If there weren't ladies present, I'd tell you what I'd call it," I snorted.

"Thanks for the compliment, my dear."

## WE'LL DO IT AGAIN IN 1940!

See G-E and you'll see the difference! Any side by side comparison with any refrigerator—value for value, styling for styling, feature for feature, mechanism vs. mechanism—*any* way you look at it you'll see why the General Electric Refrigerator will pace the field again in 1940, and prices are even lower than '39!

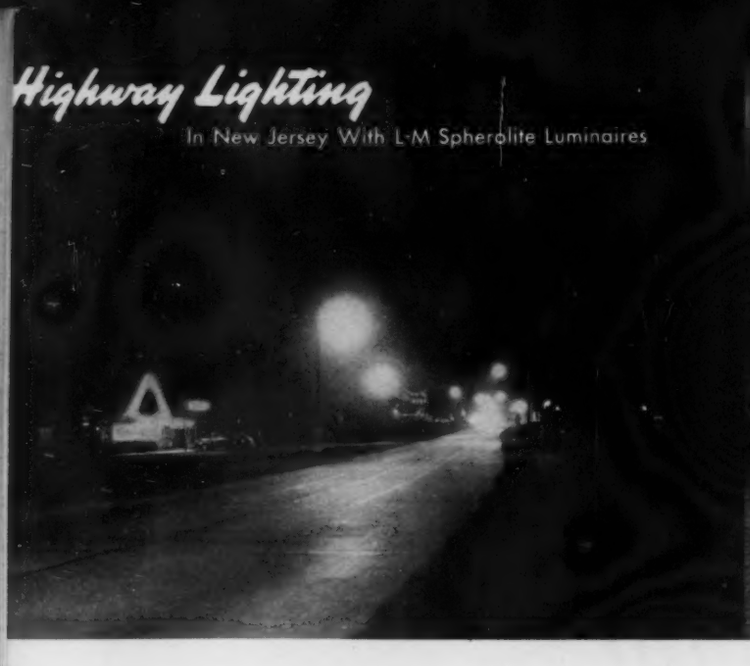
The new 1940 G-E—the refrigerator with *Conditioned Air*—is already a news sensation from coast to coast. Watch it go!

**GENERAL ELECTRIC COMPANY**
**APPLIANCE AND MERCHANDISE DEPT.**
**BRIDGEPORT, CONN.**

★ ★ ★

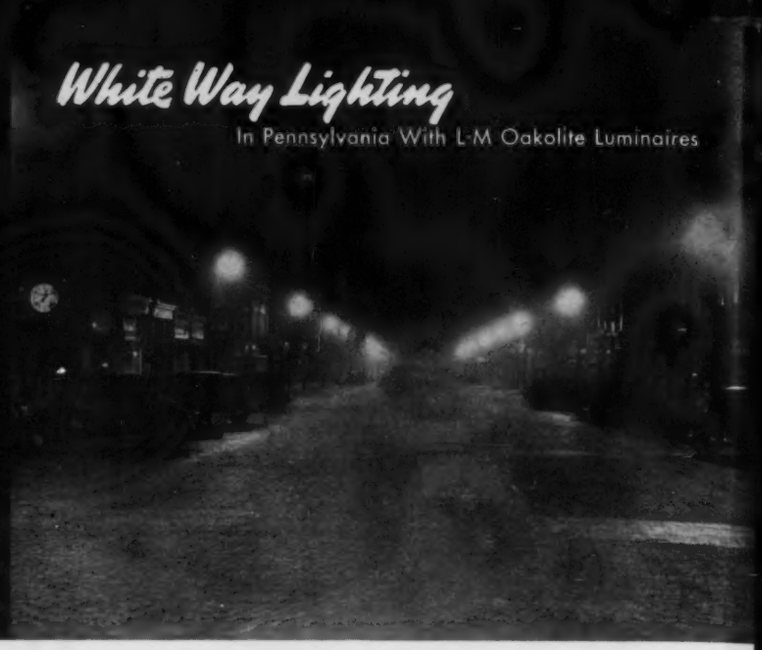
A FULL Line of electric appliances for the home — G-E Electric Ranges, Electric Sink (with Dishwasher and Garbage Disposall), Water Heaters, Washers, Ironers, Cleaners, Radios, Sun Lamps, Clocks, Fans, Small Appliances—backed by the combined research, engineering skill and manufacturing experience of the world's oldest and largest electrical manufacturing company.

**GENERAL ELECTRIC**



*Highway Lighting*

In New Jersey With L-M Spherolite Luminaires



*White Way Lighting*

In Pennsylvania With L-M Oakolite Luminaires

# EVERYTHING YOU NEED FOR EVERY TYPE OF *Outdoor Lighting*

**Not only the latest, most efficient designs in standards and luminaires, but transformers, cutouts, relays, glassware, time switches... everything for effective outdoor lighting. Line Material Company service offices at Los Angeles, Oakland, Portland, Seattle, Denver, Phoenix, and Spokane.**

*Bridge Lighting*

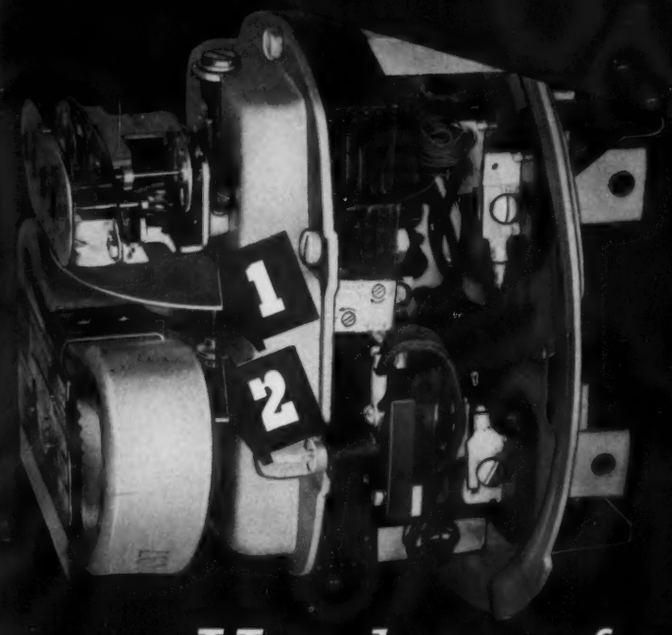
In Ohio With L-M Sansver Luminaires

*Floodlighting*

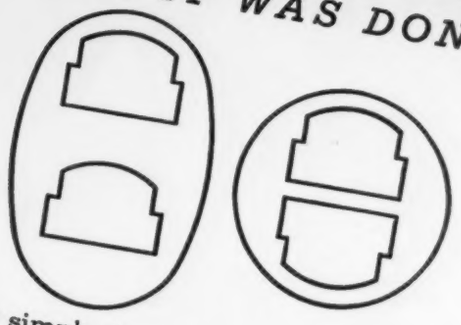
In Illinois With L-M National Jr. Luminaires

# LINE MATERIAL CO.

# TWO DISCS
## *in a Single-Phase Case*




**HOW IT WAS DONE**



By simply inverting one element as shown—all fundamentals of previous design retained.

## *Yet lots of room to spare*

### INVERTED ELEMENT POLYPHASE DESIGN
#### SAVES SPACE—SAVES COST

By using standard parts and inverting one element, Westinghouse has built a polyphase meter small enough to fit into a single-phase case—and at the same time has retained the fundamentally sound principle of a separate disc for each element.

The mechanical simplicity of the design produced great compactness and this leaves plenty of room in the case for all standard accessories. Thermal capacity and over-all accuracy have been improved and yet the price is lower!

And like the single-phase meter, the *Westinghouse* polyphase has the same features that give all Westinghouse Meters their Long-Time Accuracy . . .

Lifetime Ball and Jewel Bearing, Gold-finished Register, One-piece Electromagnet and No Mechanical Adjustment.

J-40259

Ask any Westinghouse man to give you complete details or address Westinghouse Elec. & Mfg. Co., Dept. 7-N, East Pittsburgh, Pa.

# Westinghouse Meters

PRINT IN BINDING

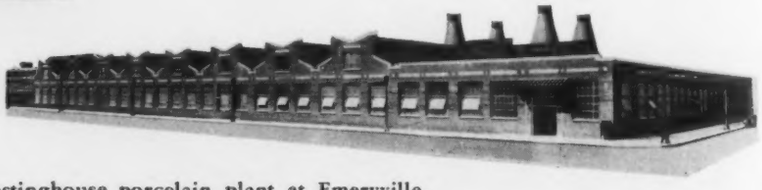
# R·I·P INSULATORS

# GUARANTEED *free from Radio Interference*

For years engineers have sought to eliminate radi interference. But it remained for Westinghouse R search and Engineering to develop, patent an produce a special metallic oxide glaze — part of th insulator itself. This glaze permanently eliminate radio interference or distressing corona at the in sulator. It is guaranteed effective at or above norm operating voltages.

This new process is simplicity itself. There are n added gadgets to create extra strain on the porcelai Instead a special metallic glaze is matured durin firing over the proper areas. This glaze is part of th insulator itself, and provides a high-resistance, co ducting path for the charging current. This co struction in no way changes the fundamental desig of the insulator and has proved completely effecti in thousands of installations from coast to coast.

Specify Westinghouse R-I-P Insulators. A nationwide network of supply depots provide overnight service. Porcelain plants in Emeryville, Cal., and Derry, Pa. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

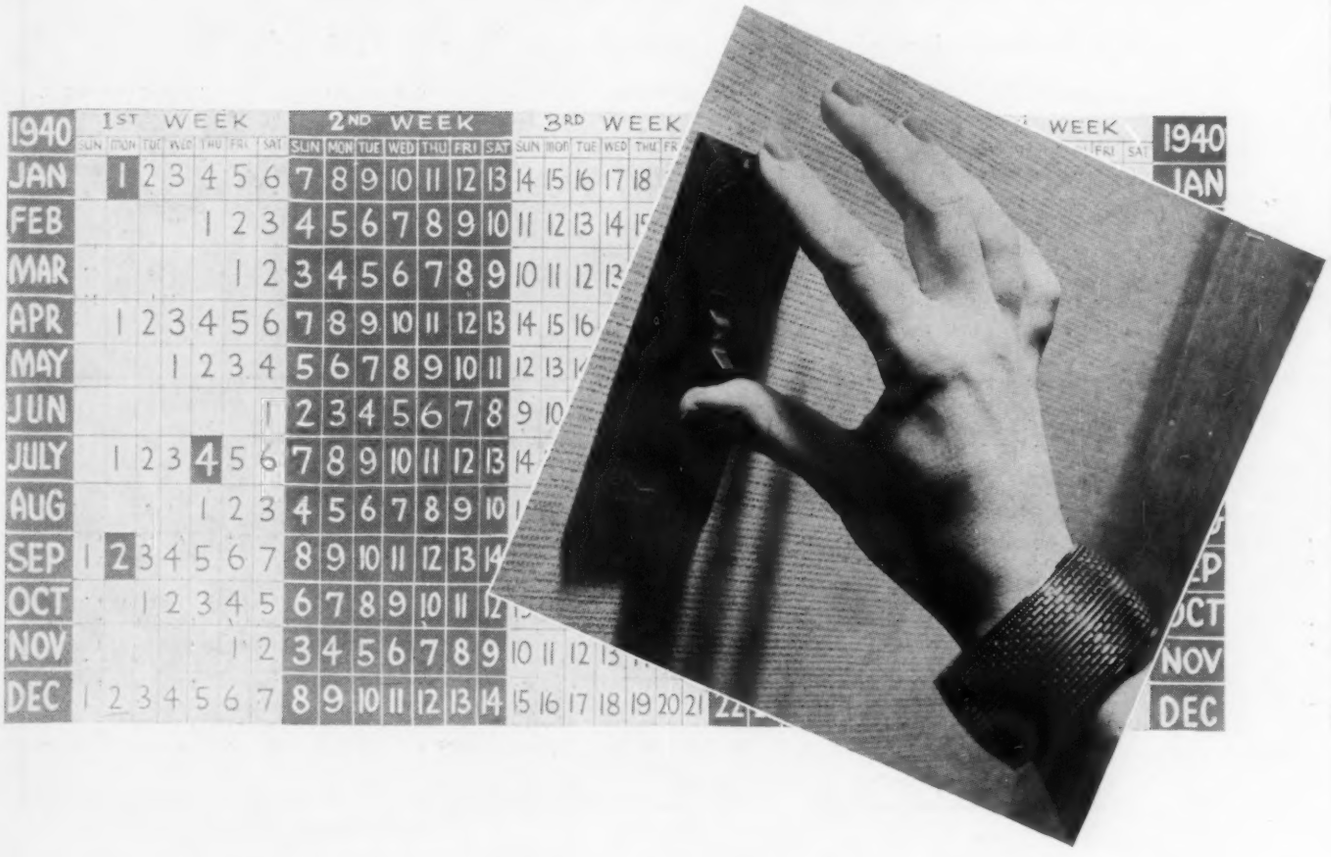


This Westinghouse porcelain plant at Emeryville, Calif., is the only porcelain plant on the West Coast. It makes all sizes of electrical porcelain for this area.

J-05086

# Westinghouse Porcelain

W WESTINGHOUSE ELECTRIC




# What Kind of 40's?

*The increases now being found necessary in the distribution field generally, emphasize what may well be the first marked steps toward the renewal of load growth at the rates to which the electric industry was accustomed in the years prior to 1929—and with that growth, a renewal of expenditures of the magnitude required in those more active years. —PG and E.*

LAST year, more generators made more revolutions than ever before in the eleven Western States, turning out nearly 22 billion kilowatt-hours in the twelve months ending with November—a 9.2% increase over the year 1938. But that quantity of work is not considered large enough to satisfy the demands this year will bring.

Last year, as many energy-consuming devices were purchased and connected by consumers as in 1937, and more than in any other year since 1931. But conservative quotas set 1940 appliance sales 9% to 16% above those for the year just past.

What strides the West made in 1939—how sound the foundation is for 1940—can be seen at a glance in Table I, at the top of the following page. If these figures are read with populations in mind—the fact that only 10% of the nation's people are in the eleven Western States—the intense electrification of the area can be understood.

For instance, 1,680 kw.-hr. per capita are generated in the eleven Western States, but only 975 kw.-hr. per capita in the nation as a whole. Or, in terms of generating capacity, there are 490 installed watts for each Westerner, but only 310 watts for one citizen of the United States.

Figures in the right hand column indicate that, on a percentage basis, the West picked up more hydro capacity than did the nation as a whole, but declined in percentage of all energy generated in hydro plants, a situation which is to be expected in a dry year. Even so, four-fifths of all hydro energy was generated in Western plants. This same fact is evident in the increased percentage of energy generated by steam.

*Approximately 27,000 new consumers were added to the system in 1939, and it is estimated that 30,000 will be connected in 1940.—Southern California Edison.*

IN all quarters of the West—from the rain-washed Pacific shores, eastward across the snow-packed divide; from palm-shaded southern planes northward to the Canadian line—in Seattle and San Francisco, in Los Angeles, in Spokane, Portland, Boise, Butte, Denver, Salt Lake City, Albuquerque and Phoenix—are voiced expectations of a steady, upward push.

## Table I—Comparison of Western to National Operations for 1938 and 1939

| | 11 Western States | | United States | | Per Cent West to U.S. | |
|---|---|---|---|---|---|---|
| | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 |
| Energy Generated (Thousands of kw.-hr.) | 19,954,682 | 21,792,254* | 114,197,403 | 126,793,881* | 17.5 | 17.2 |
| Energy Generated in Hydro Plants (Thousands of kw.-hr.) | 17,882,932 | 18,209,919* | 44,547,005 | 44,481,974* | 40.2 | 40.9 |
| Energy Generated in Fuel Plants (Thousands of kw.-hr.) | 2,071,750 | 3,548,136* | 69,650,398 | 82,285,907* | 3.0 | 4.3 |
| Percentage of Hydro to Total Generated | 89.6 | 83.5 | 38.9 | 35.1 | | |
| Installed Generator Capacity (kw.) | 6,200,712† | 6,378,619‡ | 39,042,105† | 40,203,969‡ | 15.9 | 15.9 |
| Installed Hydro Capacity (kw.) | 4,122,756† | 4,292,027‡ | 11,066,063† | 11,353,925‡ | 37.4 | 37.8 |
| Revenue from Energy Sales (Thousands of dollars) | 283,000§ | 325,000§ | 2,168,495§ | 2,304,000§ | 13.1 | 14.1 |

* Twelve months ending November. † FPC as of Jan. 1, 1939. ‡ FPC preliminary for Oct. 1, 1939. § EEI report.

## Table II—Ten-Year Generation Record for Western Public Utilities

(Thousands of Kw.-hr.)

| State | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arizona | 283,023 | 384,443 | 404,309 | 280,898 | 295,688 | 344,939 | 377,797 | 510,483 | 693,524 | 676,349 | 1,191,769 |
| California | 8,849,662 | 8,948,326 | 8,796,177 | 7,948,505 | 8,023,243 | 8,562,056 | 9,060,296 | 10,091,716 | 9,598,651 | 9,391,340 | 9,449,327 |
| Colorado | 563,813 | 573,341 | 528,817 | 478,263 | 459,453 | 506,710 | 549,157 | 652,404 | 682,222 | 693,344 | 722,524 |
| Idaho | 894,417 | 911,709 | 796,484 | 584,589 | 594,428 | 685,069 | 672,466 | 796,430 | 972,212 | 992,278 | 1,218,526 |
| Montana | 1,613,688 | 1,319,800 | 966,097 | 635,093 | 922,814 | 867,504 | 1,296,199 | 1,452,390 | 1,319,637 | 1,324,151 | 1,568,864 |
| Nevada | 43,840 | 42,895 | 19,006 | 32,749 | 24,231 | 32,152 | 27,719 | 171,499 | 1,152,788 | 1,491,205 | 1,818,846 |
| New Mexico | 67,179 | 75,871 | 179,658 | 157,611 | 157,482 | 173,233 | 190,744 | 214,602 | 254,880 | 261,717 | 279,115 |
| Oregon | 1,161,386 | 1,219,250 | 1,176,987 | 968,980 | 965,748 | 1,002,328 | 1,083,818 | 1,250,421 | 1,391,715 | 1,253,134 | 1,442,055 |
| Utah | 402,005 | 292,550 | 276,483 | 275,476 | 327,379 | 206,679 | 309,835 | 418,194 | 507,415 | 340,172 | 403,989 |
| Washington | 2,552,325 | 2,555,233 | 2,572,134 | 2,486,754 | 2,438,832 | 2,747,366 | 2,981,621 | 3,273,148 | 3,727,223 | 3,393,036 | 3,557,714 |
| Wyoming | 98,665 | 98,215 | 94,539 | 84,633 | 78,964 | 81,856 | 93,779 | 114,755 | 130,007 | 137,956 | 137,522 |

* FPC reports for twelve months ending November.

"This year we anticipate making new connections at an increased rate." So run the reports.

This growth of electrical customers, which bespeaks the underlying expansion of the entire West, is indicated in Table III, which classifies customers according to type of usage and according to state. The figures for 1939, while relatively correct and useful as a guide, definitely are too small. Direct reports from Western systems at year's end show that a minimum of 125,000 new customers were connected in the residential and rural classifications alone—a figure which is greater than the sum of all classifications in Table III.

Other measures of Western business likewise indicate steady gains. The reports on customer additions are borne out by those on Western residential building, which has shown increases for five successive years, and which last year hit a 15-year high. The number of permits issued in the Far West was 6% greater than in 1929.

Total building, although not yet at its former peak, has likewise shown a 5-year rise and last year was close to the 1930 level. Other indices for the Far West—including factory employment, factory payrolls, car-loadings and cash farm incomes—are 2% to 5% under 1937, but higher than those in any other year since 1930 or 1929.

How the electrical industry has figured in this picture can be measured in generation, which is traced through a ten-year period by states in Table II. It should be noted that 1939 figures are not strictly comparable, although representing a close approximation of generation for the year. They show a twelve-month period ending with November, and were shifted back one month in order to include only figures which are complete.

Taken together, the foregoing indicate the fundamental nature of Western expansion in the electrical field—a compound of continuous pioneering toward higher levels of per customer use, and the continual connecting of new business enterprises and homes.

*Among the Geographic Divisions, the Pacific Division ranks lowest for 11 of the 12 (types of electric) bills, with the 12th bill ranking 2nd.—Federal Power Commission.*

FPC's Pacific Division embraces California, Oregon and Washington and represents 78% of the electric customers in the eleven Western States. The single category in which Pacific rates were not the lowest of the nine divisions, and in which they were second lowest, was that covering average residential bills for 25 kw.-hr., as of Jan. 1, 1939.

Even in this category, however, Pacific Division rates were 14% under the national average, undercut only by the East South Central division at 16%. Because the West is a region of high usage, its standing in the other categories is more significant. Residential rates for 100 kw.-hr. were 17% under the national average, for 250 kw.-hr., 18%. The costs of these amounts of energy were $1.31, $3.20 and $6.20.

The effect of the foregoing figures can be seen in Table I, where the West is shown as generating 18% of the nation's energy but collecting only 14%

of the revenue. All this adds up to the soundest sort of basis on which to build. For, as is well known, low rates and high usage go hand in hand.

*In the expansive years from the World War to 1929 the electric utilities kept pace with the other industries of the nation in the general upward movement. But while the others turned downward in the unhappy '30s, the utilities dug in their toes, and after a short interlude continued to climb. This is the record. —Electrical World.*

THE steady current of Western expansion tends to delay and cushion the effects of the nation's business swings. But the records show that the West is to a degree dependent on the state of the nation as a whole.

Nationally, electric utilities are looking forward to an active year. An estimated $605,000,000 expenditure is in prospect for this year, of which the West's budget of more than 80 million, accounts for 13%.

These figures cover private and municipal systems only. Just how the West will spend its 80 million, together with the expenditures to be made by federal agencies in the West, are discussed in detail, beginning on p. 38. This budget indicates an increase in capital expenditures on the order of 10% over those made in 1939.

Detailed reports on the sales outlook, referred to above, begin on p. 53.

*Industry is in a state of flux because of the changing economic relation between the dominant "plant factors" of transportation, power, labor and population trends. The West does not suffer through a coordination of these changing factors . . . therein lies the West's opportunity. It is no idle dream.—Electrical West, February 1939.*

THE rising importance of industrial loads cannot be overlooked. Major event toward year's end was the signing of a contract between the Bonneville Administration and Aluminum Company of America, whereby the latter will take 32,500 kw. for use in a plant which it is constructing near the Columbia River.

PG and E's major generating additions—three 35,000-kw. steam units—are being constructed to work in conjunction with oil refineries. Southern Colorado Power is adding a steam unit, principally to take care of industrial load. Southern California Edison specifically mentions load growth traceable to aircraft manufacturing.

These may be indications that the West's hour for industrial expansion is close at hand. The lure of low-cost power has been here for a long time. And each year that commanding factor —market—grows.

But regardless of whether this shift of industry takes place three years hence or ten, all signs show that plenty of electrical activity will be necessary to keep pace with the expansion of business that's already here. On the following pages, the exact nature of the immediate program is set forth by the men who have laid it out.

## Table III—Customers Grouped by Type of Consumption for 1938 and 1939

| | Agricultural Customers | | Residential Customers | | Commercial and Industrial* | | Municipal, Rail and Misc. | | Total Customers | |
|---|---|---|---|---|---|---|---|---|---|---|
| State | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 | 1938 | 1939 |
| Arizona | 7,082 | 8,000 | 74,353 | 73,569 | 14,068 | 14,130 | 298 | 301 | 95,801 | 96,000 |
| California | 120,000 | 124,500 | 1,683,140 | 1,729,551 | 304,894 | 276,700 | 11,161 | 11,249 | 2,119,195 | 2,142,000 |
| Colorado | 11,911 | 17,100 | 186,912 | 188,724 | 40,111 | 37,600 | 314 | 376 | 239,148 | 243,800 |
| Idaho | 21,428 | 24,000 | 72,806 | 75,694 | 13,893 | 14,180 | 1,104 | 1,126 | 109,231 | 115,000 |
| Montana | 4,847 | 6,600 | 82,226 | 85,818 | 16,040 | 16,250 | 1,228 | 1,332 | 104,341 | 110 000 |
| Nevada | 1,271 | 1,300 | 18,360 | 19,740 | 4,724 | 4,520 | 96 | 40 | 24,451 | 25,600 |
| New Mexico | 2,300 | 3,400 | 34,637 | 34,410 | 9,560 | 9,510 | 149 | 180 | 46,646 | 47,500 |
| Oregon | 32,578 | 35,800 | 207,415 | 212,377 | 45,210 | 46,880 | 1,443 | 1,543 | 286,646 | 296,600 |
| Utah | 19,172 | 19,500 | 93,490 | 95,436 | 15,270 | 15,050 | 879 | 914 | 128,819 | 130,900 |
| Washington | 50,184 | 55,500 | 373,708 | 388,795 | 62,723 | 63,730 | 1,767 | 1,975 | 488,382 | 510,000 |
| Wyoming | 2,079 | 3,600 | 32,768 | 34,430 | 7,516 | 7,470 | 314 | 376 | 42,453 | 45,600 |
| 11 Western States | 272,852 | 299,300 | 2,859,815 | 2,938,544 | 533,917 | 506,020 | 18,529 | 19,136 | 3,685,113 | 3,763,000 |
| United States | 1,406,579 | 1,786,000 | 22,110,403 | 22,665,243 | 4,231,039 | 4,190,860 | 103,450 | 107,897 | 27,851,471 | 28,750,000 |

*Indicated losses are due to reclassification. 1939 estimated on basis of first ten months. Source: EEI

## Table IV—Type and Capacity of Utility Generators, October, 1939

| | | | | Generator Capacity of Plants Operated by | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | One Type of Prime Mover | | | | | | Combination of Two or More Types | | |
| | | | Total Capacity | Water Power | | Steam Power | | Internal Comb. Engines | | Total | Water Power | Steam Power | Int. Comb. Engines |
| State | Companies* | Plants† | Kw. | No. | Kw. | No. | Kw. | No. | Kw. | No. | Kw. | Kw. | Kw. |
| Arizona | 21 | 45 | 420,711 | 12 | 292,050 | 8 | 77,810 | 20 | 25,618 | 5 | 25,233 | 0 | 7,217 | 18,016 |
| California | 33 | 156 | 2,793,575 | 116 | 1,681,789 | 26 | 1,066,322 | 12 | 43,799 | 2 | 1,665 | 780 | 0 | 885 |
| Colorado | 37 | 77 | 288,155 | 21 | 62,727 | 31 | 213,616 | 17 | 8,631 | 8 | 3,181 | 1,460 | 575 | 1,146 |
| Idaho | 17 | 47 | 260,148 | 39 | 255,066 | 2 | 600 | 3 | 1,612 | 3 | 2,870 | 2,210 | 0 | 660 |
| Montana | 13 | 32 | 330,826 | 18 | 321,210 | 4 | 5,265 | 7 | 1,719 | 3 | 2,632 | 180 | 1,476 | 976 |
| Nevada | 8 | 13 | 509,007 | 7 | 503,350 | 0 | 0 | 4 | 2,310 | 2 | 3,356 | 400 | 2,500 | 456 |
| New Mexico | 18 | 38 | 104,242 | 1 | 80 | 12 | 86,045 | 22 | 13,301 | 3 | 4,816 | 760 | 1,150 | 2,906 |
| Oregon | 29 | 71 | 445,879 | 45 | 263,076 | 16 | 174,300 | 6 | 2,533 | 4 | 5,970 | 2,030 | 300 | 3,640 |
| Utah | 23 | 61 | 160,155 | 46 | 87,867 | 2 | 59,750 | 5 | 2,945 | 8 | 9,593 | 3,805 | 0 | 5,788 |
| Washington | 30 | 70 | 1,013,646 | 50 | 794,335 | 13 | 215,520 | 4 | 1,055 | 3 | 3,736 | 2,140 | 1,100 | 496 |
| Wyoming | 24 | 39 | 52,275 | 8 | 15,182 | 17 | 31,134 | 9 | 3,515 | 5 | 2,444 | 1,530 | 372 | 542 |
| 11 Western States | 253 | 649 | 6,378,619 | 363 | 4,276,732 | 131 | 1,929,362 | 109 | 107,029 | 46 | 65,496 | 15,295 | 14,690 | 35,511 |
| United States | 1,760 | 3,879 | 40,203,969 | 1,412 | 11,134,156 | 1,189 | 27,553,710 | 1,047 | 693,812 | 231 | 822,291 | 219,769 | 486,166 | 116,356 |

* Only companies and municipalities which generate. Duplications appear for interstate operations.
† Includes all plants of 100 Kw. or more generating for public use.
Preliminary FPC Reports.

# PLANT EXPANSION FOR '39 & '40

***System budgets show 10% increase; growth recorded in all sections of the West; new***

OUT of the mass of confusion as to what 1940 will be like, there emerges — for electrical plant men in the Western States—the picture of a very busy year. Sketched by engineers are the outlines of a program of exceptional proportions, and one which many believe is merely the forerunner of what lies beyond.

Four federal agencies and forty central-station systems have helped to sketch this picture of the year ahead. To the chief engineers and other executives in these groups go ELECTRICAL WEST's sincere thanks for the time they spent on details which make this picture so complete.

The forty central-station systems alone report the following additions and improvements to their plants:

| | |
|---|---|
| Spent in 1939 | $73,340,000 |
| Budgeted for 1940 | $80,427,000 |
| Increase | 9.7% |

Much of the money budgeted for 1940 is for projects already started or for equipment which is urgently needed to carry this year's peaks . These facts, coupled with the probability that several other, unbudgeted additions will be made throughout the year, suggest that work done may be even larger than the aggregate of budgets shows.

Unbudgeted additions are especially probable in southern California. The area as a whole leans heavily on Boulder power, and steam is needed for standby and for peaks. The Los Angeles Bureau's interest in steam standby is increasing month by month and, although the Bureau does not say so, may crystallize in the ordering of a 75,000-kw. plant as early as this June.

Peak capacity is needed at San Diego, and the system confronts the alternatives of adding 35,000 kw. or interconnecting to the North.

Southern California's steam capacity will be increased by units going in this year at Burbank and Glendale; but these are not significant in terms of the region as a whole. Turbines will also be installed by Southern Colorado Power and the City of Eugene.

Biggest steam additions are of course Pacific Gas and Electric's three 35,000-kw. units, being installed at oil refineries along the eastern shores of San Francisco Bay. Two of these will be completed this year, and the third in 1941.

What with Bonneville champing at the bit and Grand Coulee just around the bend, hydro capacity is abundant in the Northwest, but Eugene's decision to add steam indicates that the possibility of other sources being added cannot be entirely dismissed.

Taken as a whole, the region's program for 1940 is again one of enlarging facilities all down the line—adding new customers and delivering more energy to those already served.

Indications are that the year will bring substantially increased demand for transformers, breakers, capacitors, regulators, disconnects, conduit, cable (other than overhead transmission) and meters. Demand for conductor, insulators, instruments and other equipment should show a slight increase over 1939.

The picture of electrical activity is only half sketched by the work of municipal and private systems. Bonneville transmission, USBR plants and REA lines appear likely to proceed in 1940 at an undiminished pace.

Among the following reports is one from PG and E, which probably is the last published over the signature of Arthur H. Markwart, who was lost to the electrical fraternity last month.

Reports appear alphabetically under each state:


| | | | |
|---|---|---|---|
| Arizona | 38 | Nevada | 47 |
| British Columbia | 40 | New Mexico | 48 |
| California | 41 | Oregon | 48 |
| Colorado | 46 | Utah | 50 |
| Idaho | 47 | Washington | 51 |
| Montana | 47 | Wyoming | 52 |


## Federal

### Army, Corps of Engineers

The Army is at work on two Western projects where power is involved. At Bonneville power plant, two additional generators are being installed; anticipated expenditure in fiscal 1940-41 is $1,500,000. An expenditure of like amount is contemplated at Fort Peck, largely for development of power.

### Bonneville Administration

A report from the acting chief engineer and tabulations showing the status of transmission lines and substations appear under Oregon, p. 48.

### Bureau of Reclamation

In a letter to ELECTRICAL WEST, R. F. Walter, chief engineer for the Bureau,

***peaks expected this year; steam additions predominate***

presented a summary of progress in 1939 and prospects for 1940 with reference to each Reclamation project which involves power in the West. This information is distributed through the following pages according to the states in which the projects are situated. Also, the status of the more important developments is tabulated on p. 42.

### Rural Electrification

REA projects in the eleven Western states are tabulated on p. 40.

# Arizona

### Arizona Edison

Our construction program in 1939 may be briefly summarized under the following classifications:

| | |
|---|---|
| Diesel Plants | $114,452 |
| Substations | 227 |
| Distribution | 52,307 |
| Maintenance | 41,625 |
| Miscellaneous | 18,148 |
| | $226,759 |

The comparable budget figures for 1940 are:

| | |
|---|---|
| Distribution | $ 40,000 |
| Miscellaneous | 30,000 |
| Maintenance | 45,000 |
| | $115,000 |

The principal difference between last year and this lies in generation. Last year we installed two diesel units of 1,250 hp. each, at Miami and Yuma. Transmission improvements were negligible. Most distribution work consisted of enlarging overhead conductor sizes and adding transformers.

The 1940 construction program may be generally summed up as follows: No major improvements in generation or transmission are contemplated. Our distribution program is along the same lines as that of last year.

The most important factor affecting the 1940 activities of this Company is unquestionably the copper situation in the United States. Our business is directly affected by the business of the local copper mines. Most important recent development has been the exclusion of the copper tariff in the reciprocal trade agreement with Chile. Its effect was immediately noted in the towns we serve. The 1940 business outlook we believe to be generally quite good.—*Ralph T. Smalley, vice-president.*

### Arizona Power

Expenditures for 1939 on new and improved facilities were $89,000. We contemplate the expenditure of $133,000 in 1940. Last year we continued a 4-year program of rebuilding the 44-kv. Verde line. A 15-mi. section of the Monte Cristo 44-kv. line was rebuilt. The balance of the expenditures were mainly on distribution system betterments to handle increased loads.

Proposed expenditures for 1940 are as follows:

| | |
|---|---|
| Generation | None |
| Transmission | $ 20,000 |
| Substations | 63,500 |
| Distribution | 38,000 |
| Miscellaneous | 11,500 |
| Total | $133,000 |

Transmission expenditure facilities are for the continuation of the Verde line, and the installation of expulsion gaps on 44-kv. lines for station protection. We propose to build a new outdoor switching rack at our Childs hydro plant for the outgoing 44-kv. circuits.

The balance is for distribution betterments, including regulators for Ash Fork.—*Malcolm M. Bridgwater, general superintendent.*

### Central Arizona L & P

Our construction program for 1940 is confined to distribution extensions, the addition of transformers, meters, etc., as required.—*A. F. Morairty, vice-president.*

### Gila Project, USBR

Contracts for the three pumping units for the Gila Project have been awarded. Total capacity of these will be 700 cu. ft. per sec. at 54-ft. lift. Installation is scheduled for the spring of 1941.

### Parker Dam Project, USBR

Construction of a power plant was begun in 1939. Three generating units of 30,000 kva. each will be installed. Completion is scheduled for the summer of 1941; 135 mi. of 161-kv. transmission line between Parker power plant and Phoenix were completed during 1939. This line will serve temporarily to deliver Boulder Dam energy until such time as the Parker Power plant is placed in operation. During 1940 there will be constructed 120 mi. of 161-kv. transmission line between Parker plant and the Gila Project.

## Status of Western REA Projects

| Project | Borrower's Name | Cumulative Allotments | 1939 Allotment |
|---|---|---|---|
| **ARIZONA** | **State Total** | $ 703,000 | $ 558,000 |
| 2 S. E.* | Stonewall Electric Co., Tucson, etc. | 65,000 | 65,000 |
| 4 Pinal* | San Carlos Irrig. & Drain. Dist., Coolidge | 145,000 | |
| 14 Cochise | Sulphur Springs Valley Elec. Coop., Inc., Willcox | 493,000 | 493,000 |
| **CALIFORNIA** | **State Total** | $1,748,500 | $ 238,000 |
| 1 Imperial* | Imperial Irrig. Dist., Imperial | 700,000 | |
| 6 Modoc* | Surprise Valley Elec., Corp., Alturas | 659,500 | 132,000 |
| 16 Plumas* | Plumas-Sierra RE Coop., Inc., Portola | 308,000 | 25,000 |
| 18 San Diego | Mountain Empire Elec. Coop., Inc., Campo | 81,000 | 81,000 |
| **COLORADO** | **State Total** | $3,402,500 | $1,770,000 |
| 7 Mesa* | Grand Valley Rural Power Lines, Inc., Grand Junction | 218,000 | |
| 14 Alamosa* | San Luis Valley RE Coop., Inc., Monte Vista | 382,500 | 65,000 |
| 15 Morgan* | Morgan County RE Assn., Fort Morgan | 605,000 | 350,000 |
| 16 Jefferson | The Intermountain RE Assn., Bailey | 114,000 | 5,000 |
| 17 Prowers* | Southeast Colorado Power Assn., LaJunta | 687,500 | 154,500 |
| 20 Delta* | Delta-Montrose Rural Power Lines Assn., Delta | 502,000 | 302,000 |
| 21 S. E. | Stonewall Electric Co., Trinidad | 39,000 | 39,000 |
| 22 Boulder | Union Rural Elec. Assn., Inc., Brighton | 325,000 | 325,000 |
| 26 San Miguel | San Miguel Power Assn., Inc., Norwood | 174,000 | 174,000 |
| 29 Phillips | Highline Electric Assn., Holyoke | 125,500 | 125,500 |
| 31 Larimer | Poudre Valley RE Assn., Inc., Severance | 230,000 | 230,000 |
| **IDAHO** | **State Total** | $2,545,750 | $ 749,000 |
| 4 and 6 Bonner* | N. Idaho RE Rehab. Assn., Inc., Sandpoint | 485,750 | 201,000 |
| 10 Nez Perce* | Clearwater Valley L & P Assn., Inc., Lewiston | 1,072,000 | 10,000 |
| 11 Kootenai* | Kootenai RE Assn., Inc., Coeur d'Alene | 264,000 | 5,000 |
| 15 Idaho* | Idaho County L & P Coop. Assn., Inc., Grangeville, Idaho | 339,000 | 148,000 |
| 16 Cassia | Raft River RE Coop., Inc., Malta | 116,000 | 116,000 |
| 17 Fremont* | Fall River RE Coop., Inc., Ashton | 182,000 | 182,000 |
| 18 Lewis | Wood River RE Coop., Inc., Richfield | 87,000 | 87,000 |
| **MONTANA** | **State Total** | $2,293,100 | $ 790,500 |
| 1 Ravalli* | Ravalli County Elec. Coop., Inc., Corvallis | 192,300 | |
| 2 Cascade* | Sun River Elec. Coop., Inc., Fairfield | 327,500 | 153,500 |
| 5 Richland* | Lower Yellowstone RE Assn., Sidney | 144,600 | |
| 9 Yellowstone* | Yellowstone Valley Elec. Coop., Inc., Huntley | 383,500 | 84,500 |
| 10 Madison* | Vigilante Elec. Coop., Inc., Twin Bridges | 270,000 | 99,000 |
| 11 Sanders* | Sanders Elec. Coop., Inc., Trout Creek | 128,000 | 34,000 |
| 12 Missoula* | Missoula Elec. Coop., Inc., Missoula | 222,000 | 145,000 |
| 13 Flathead* | Flathead Elec. Coop., Inc., Kalispell | 243,700 | |
| 15 Fergus* | Fergus Elec. Coop., Inc., Lewistown | 226,000 | 138,000 |
| 16 Park* | Park Elec. Coop., Inc., Livingston | 119,000 | |
| 17 Rosebud | Mid-Yellowstone Elec. Coop., Inc., Hysham | 136,500 | 136,500 |
| **NEVADA** | **State Total** | $ 227,000 | $ 54,000 |
| 4 Overton* | Overton Power Dist. No. 5, Overton | 227,000 | 54,000 |
| **NEW MEXICO** | **State Total** | $ 710,000 | $ 57,000 |
| 4 Eddy* | Central Valley Elec. Memb. Corp., Artesia | 312,000 | 52,000 |
| 8 Roosevelt | Roosevelt Co. Elec. Memb. Corp., Portales | 182,000 | 5,000 |
| 9 Curry* | Farmers Electric Memb. Corp., Clovis | 216,000 | |
| **OREGON** | **State Total** | $1,002,500 | $ 450,500 |
| 2 Lane* | Blachly-Lane County Coop. Elec. Assn., Blachly | 139,000 | 12,000 |
| 4 Lincoln | Benton-Lincoln Electric Coop., Inc., Corvallis | 265,000 | 265,000 |
| 5 Clatsop* | Nehalem Valley Coop. Elec. Assn., Jewell | 89,000 | 7,000 |
| 14 Umatilla* | Umatilla Electric Coop. Assn., Hermiston | 258,000 | 47,000 |
| 17 Douglas* | West Douglas Electric Coop., Inc., Roseburg | 132,000 | |
| 21 Coos | Coos Electric Coop., Inc., Coquille | 119,500 | 119,500 |
| **UTAH** | **State Total** | $ 579,000 | $ 315,000 |
| 6 Garfield | Garkane Power Co., Inc., Panguitch | 205,000 | 20,000 |
| 7 P L & P* | Peoples L & P Co., Loa | 5,000 | |
| 8 Duchesne | Moon Lake Electric Assn., Mt. Emmons | 369,000 | 295,000 |
| **WASHINGTON** | **State Total** | $3,644,200 | $2,027,500 |
| 8 benton* | Benton Rural Elec. Assn., Prosser | 232,500 | 129,000 |
| 9 San Juan* | Orcas P & L Co., Eastbound | 135,000 | |
| 14 King* | Mutual P & L Assn. of Tanner, North Bend | 22,200 | |
| 18 Spokane* | Inland Empire RE, Inc., Spokane | 1,564,000 | 535,000 |
| 20 Columbia | Columbia County RE Assn., Inc., Dayton | 82,000 | 82,000 |
| 23 Grays Harbor* | Quinault Light Co., Quinault | 79,000 | |
| 25 Cowlitz* | PUD No. 1 of Cowlitz Co., Kelso | 146,000 | |
| 27 Lewis* | PUD No. 1 of Lewis Co., Chehalis | 359,500 | 257,500 |
| 28 Kittitas | PUD No. 1 of Kittitas Co., Ellensburg | 156,000 | 156,000 |
| 30 Stevens | Stevens County Elec. Coop., Inc., Colville | 331,000 | 331,000 |
| 32 Okanogan | Okanogan County Electric Coop., Inc., Winthrop | 66,000 | 66,000 |
| 35 PendOreille | Pend Oreille Elec. Coop., Inc., Newport | 204,000 | 204,000 |
| 36 Adams | Big Bend Elec. Coop., Inc., Ritzville | 267,000 | 267,000 |
| **WYOMING** | **State Total** | $1,719,800 | $ 462,000 |
| 3 Fremont | Riverton Valley Elec. Assn., Inc., Riverton | 165,000 | 62,000 |
| 5 Big Horn* | Big Horn RE Co., Basin | 299,000 | 10,000 |
| 6 Goshen* | Wyrulec Company, Lingle | 243,000 | |
| 9 Uinta | Bridger Valley Elec. Assn., Inc., Mountain View | 112,000 | 112,000 |
| 10 Platte* | Wheatland RE Assn., Wheatland | 80,000 | 12,000 |
| 11 Lincoln* | Lower Valley P & L, Inc., Freedom | 426,000 | |
| 12 Park* | Garland L & P Co., Powell | 72,300 | |
| 13 Washakie* | Washakie RE Co., Worland | 56,500 | |
| 14 Laramie | Rural Elec. Co., Pine Bluffs | 242,000 | 242,000 |
| 17 S E | Same as Colorado 21 S.E. | 24,000 | 24,000 |

* Energized in part or in whole.

## Generating Plants

| Project | Location of Plant | KW Capacity | Type | Status |
|---|---|---|---|---|
| Arizona 14 Cochise | | | | Allotted |
| California 6 Modoc | Near Alturas, Modoc County | 597 | Diesel | Operating |
| Idaho 4 Bonner | | | | Allotted |
| Oregon 2 Lane | Blachley, Lane County | 150 | Hydro | Operating |
| Utah 6 Garfield | Hatch, Garfield County | 200 | Diesel | Under Const. |
| Utah 8 Duchesne | | | | Allotted |
| Washington 9 San Juan | San Juan Orcas Island, San Juan Co. | 150 | Diesel | Operating |
| Washington 23 Grays Harbor | Quinault, Grays Harbor County | 250 | Hydro | Operating |
| Washington 27 Lewis Co. | Randle, Lewis County | 80 | Diesel | Operating |
| Wyoming 9 Uinta | Lyman, Uinta County | 100 | Nat. Gas | Specs. App'v'd |
| Wyoming 11 Lincoln | Near Freedom, Lincoln County | 600 | Hydro | Operating |

### Salt River Valley Assn.

The Association expended during 1939, $125,000 for additions to existing generating stations, and no additions have been planned for 1940 so far. The expenditures for other additions and improvements were $120,000 for 1939, and we expect to expend $125,000 during 1940.

A 3,000-kw. generating unit replaced three 700-kw. generating units retired. Balance is additions to the distribution stations and lines. Additions contemplated for 1940 are for natural increase in business and will only be made as needed.—*F. L. Roe, superintendent of power.*

### Tucson G, E L & P

Our construction expenditures during 1939 were $182,000, and our estimated expenditures during 1940, $225,000.

Construction during 1939, particularly residential, exceeded all previous years with the result that our company shows an increase of about 8% in electric consumers for the year. Also, our power plant output for the year hit an all time high. General business conditions improved materially due to increased operation of the large mines and the opening of several small mines in the vicinity of Tucson.

During the year our company constructed approximately 80 mi. of distribution lines, part under an REA loan. There remain approximately 15 mi. of line to be constructed under this project.

During 1940 there will be a material increase in our irrigation load due to increased acreage to be planted, principally in cotton. We also plan on doubling the capacity of several of our substations in the vicinity of Tucson and increasing the voltage on several of our distribution circuits to take care of increasing loads.—*M. A. Pooler, vice-president and general manager.*

# British Columbia

### B C Electric Railway

Indications are that 1940 will be another quiet year with us, so far as new construction is concerned. We may have to enlarge our transformer capacities in a few distribution substations, but our budget for this work has not yet been approved.

No new transmission was built last year; distribution lines were extended 41.6 mi., bringing the total to 2,249 mi. A major job was enlargement of Burnaby substation, including addition

of a second bank of three 10,000-kva., 60/34.6-kv. transformers, and a second bank of three 500-kva., 34.6/2.3-kv., together with switching facilities on both sides of each. This is practically completed. An enlargement at Chilliwack substation is getting under way now.

Two 1,000-kw. synchronous converters were installed for the d.c. system. Extensive pole replacement continues at the rate of about 4,000 poles per year.

At Ruskin hydro plant, where a second unit was installed in 1938, breaker speeds and capacities were increased and the protective system modernized in 1939.—*A. Vilstrup, chief electrical engineer.*

## Coast Counties G & E

Total expenditures in the electric department for new and improved facilities in 1939 amounted to $375,000, while the amount budgeted for 1940 is approximately $350,000.

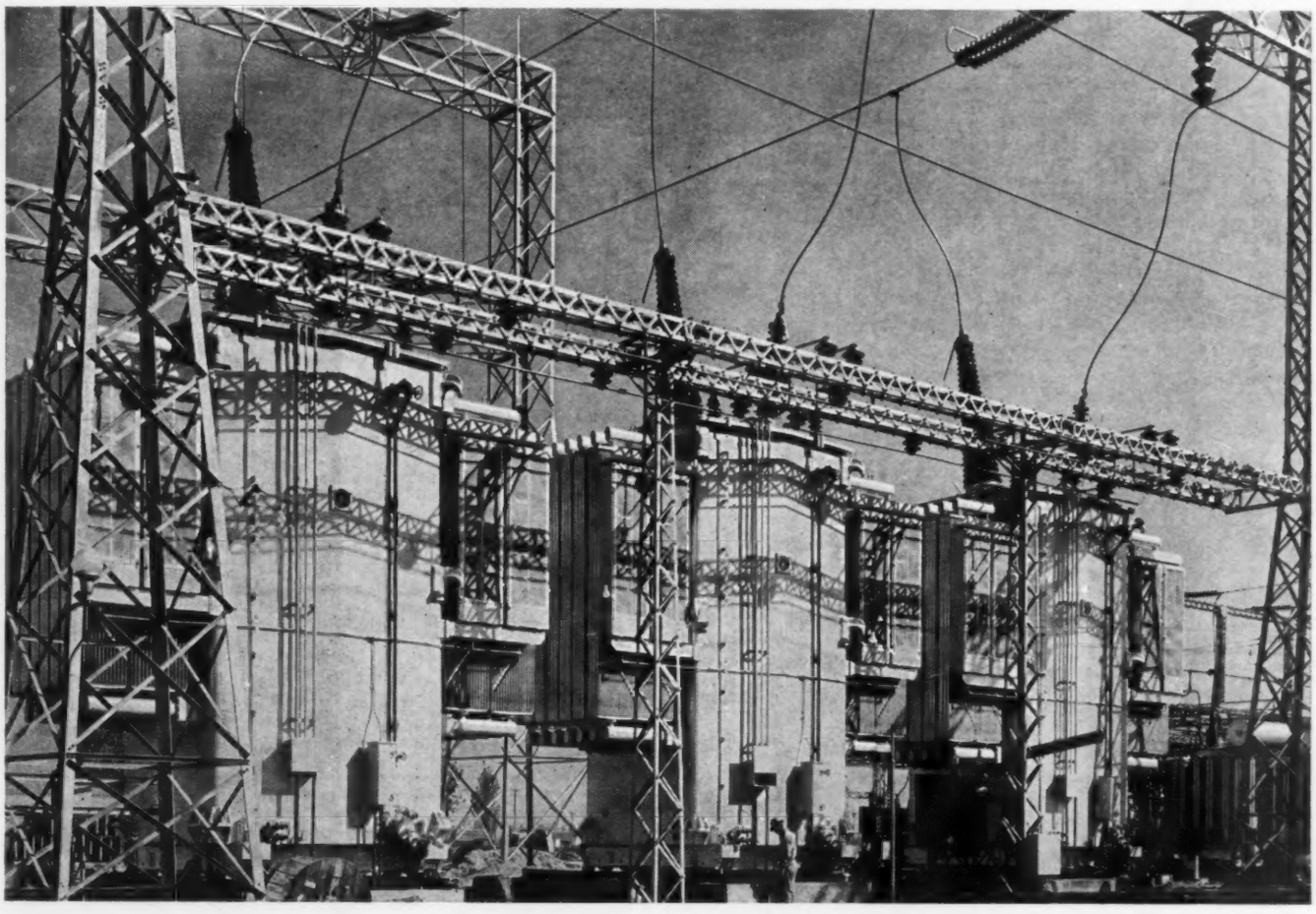
Last year 20 mi. of 60-kv. transmission was constructed. This line was necessary properly to serve Santa Cruz area and it will not be necessary for us to make any expenditures of like nature during 1940. This accounts for the decrease in the amount budgeted.

The balance of our 1939 expenditures covered new lines to serve new customers and rebuilding older lines where necessary. Eleven miles of 22-kv. transmission between Morgan Hill and Gilroy were rebuilt and reconductored, as were 5 mi. of the same type of line near San Juan.

This year $40,000 will be spent on replacement of copper and reinsulating transmission lines, while about $70,000 will be spent on additional substation transformer equipment, including 60-kv. oil breakers.

All indications in territory served by our company point toward growth continuing through the year.—*A. E. Strong, general superintendent.*

*Westinghouse Photo*



**FOUR AUTO TRANSFORMERS** installed for the Los Angeles Bureau last year are physically the largest ever built. They stand 37 ft., have 24-ft. bushings. Said to have an efficiency of 99.6%, they are rated 65,000 kva., 275/138 kv., are used to step down from Boulder line

# California

## Central Valley Project, USBR

During 1939 contracts for four 75,000 kva., and two 2,500 kva. generating units were awarded. These units are scheduled for completion during 1942. Completion of four pumping plants on the Contra Costa Canal is scheduled for the spring of 1940.

## Glendale PS Dept.

The Public Service Department of Glendale made no major improvements during 1939, confining its activities to routine replacements and betterments. The approximate amount expended during the year for this work was $234,000, while in 1940 it is proposed to spend approximately $1,800,000 for new improvements.

This large increase is primarily for the construction of a 20,000-kw. steam generating station, for which ground has already been broken. This plant is necessary to supplement the City's Boulder allotment and to furnish the necessary regulating plant capacity to the Boulder transmission line and also

to furnish 100% standby service in case of failure of the Boulder transmission line.

The plant will consist of one 20,000-kw. turbo-generator, two boilers, each of 200,000 lb. per hr. and designed for 740 lb. maximum pressure, the operating throttle pressure, 610 lb., 825° superheat. Contracts have been awarded for the turbo-generator unit to the General Electric Co., two boilers to Combustion Engineering Co., condenser to the Ingersoll-Rand Co. In connection with the plant will be an outdoor 34.5-kv. switching station, tying in with the city's 34-kv. transmission system. A unique feature of the plant itself is that it will be of the semi-outdoor type without the conventional super-structure over the turbine deck. It is contemplated that the plant will be ready for operation by December.

In addition to the above, the regular improvements and additions will be made to the distribution system and substations, chiefly in primary feeder capacity.—*P. Diederich, superintendent of Public Service Dept.*

## Imperial Irrigation District

During 1939, we expended about $2,250,000. The program included generation, transmission and distribution.

Two hydro plants were begun on the All-American canal: 9,600 kw. at Drop 4, and 4,800 kw. at Drop 3. These will be completed early this year. Two 2,500-kw. diesel sets were added at the Brawley plant, raising installed diesel capacity to 12,000 kw. Transmission construction embraced 25 mi. of 33-kv. line.

Distribution additions in rural and suburban areas totalled 175 mi. of 4- and 12-kv. lines. The diesel additions necessitated two transformer banks, totaling 7,500 kva. In addition, a 33-kv. switching station and a 750-kva. substation were added for an industrial load, which accounted also for 20 mi. of the transmission mentioned above.

Construction of the hydro plants will continue under the 1940 budget, and their completion will close the present major construction program. However, about 50 mi. of additional rural distribution is scheduled for 1940.—*M. J. Dowd, chief engineer and general superintendent.*

## Los Angeles Bureau of P & L

During the past year there was spent for new and improved facilities on the general system, approximately $10,500,000, in addition to which there were expenditures of approximately $8,500,000 for construction work on the third transmission circuit from Boulder power plant to Los Angeles, and terminal facilities. During the first six months of 1940, expenditures for new and improved facilities on the general system are expected to be approximately $5,500,000. (Budgets are based on fiscal years ending June 30).

**Summary of 1939**

GENERATION—A 2,500-kw. steam turbine unit for auxiliaries and induced draft fans were installed at Seal Beach plant. Additions and betterments were made on three 17,500-kva. hydro units at San Francisquito power plant No. 2, to obtain increased efficiency and output.

TRANSMISSION—The placing in operation in 1939 of the Victorville to Los Angeles section, approximately 76 mi., of the 275-kv. third circuit from Boulder power plant to Los Angeles, added 50,000 kw. in effective operating capacity to the system. The carrier-current communication facilities between Los Angeles and Boulder power plant were augmented by a metallic circuit.

DISTRIBUTION — Activities included: (overhead) 27-pole-line mi. of primary and secondary distribution and 23 circuit mi. of 34.5-kv. line; (underground) 140 cable mi. of primary and secondary, and 9 cable mi. of 34.5-kv. line. Installed transformer capacity was increased 148,000 kva., and 12 regulated feeders were installed in the overhead and underground systems.

RECEIVING AND DISTRIBUTING SYSTEMS—Receiving Station facilities were added at Receiving Station "E" to receive power from the Third Circuit from Boulder power plant. Transformer additions and changes at new and existing distributing stations resulted in a net increase of 113,650 kva.

**Summary of 1940**

GENERATION—It is expected that one additional 82,500-kva. unit at Boulder will be ready for operation by December. Improvements will be made to water wheels and generating units at San Francisquito power plant No. 1, to increase efficiency and output.

TRANSMISSION—The completion during 1940 of the third 275-kv. transmission circuit between Victorville switching station and Boulder, approximately 183 mi., will add an additional 100,000 kw. in effective operating capacity to the system.

DISTRIBUTION — Activities for the year will include: (overhead) 30 pole-line mi. of primary and secondary distribution, 20 circuit mi. of 34.5-kv. line, reinsulating 300 mi. of 2,400- and 4,000-volt lines for 4,800-volt delta operation; (underground) 5 mi. of conduit, 2 circuit mi. of 34.5-kv. cables, 40,000 kva. of transformers to be installed or replaced, and 30 regulated feeders to be installed in the overhead and underground systems.

RECEIVING AND DISTRIBUTING STATIONS—The installation of a 60,000-kva. synchronous condenser started in 1939 will be completed. Construction of new distributing stations will add 51,000 kva. in transformer capacity, in addition to which, changes at existing stations will result in the addition of approximately 50,000 kva.—*E. F. Scattergood, chief electrical engineer and general manager.*

## Metropolitan Water District

During 1939, we spent about $850,000 in completing the five main pumping plants on the Colorado River Aqueduct. Following completion of the main aqueduct, the construction power system, including 430 mi. of 66- and 33-kv. transmission lines, was

### Current and Future Power Development on Bureau of Reclamation Projects

| Name of Project | State | River | Purpose (1) |
|---|---|---|---|
| Boulder Canyon | Ariz.-Nevada | Colorado | F. C., Irr., P. |
| Columbia Basin | Washington | Columbia | F. C., Irr., P. |
| Central Valley | California | Sacramento | F. C., Irr., P. |
| Kendrick | Wyoming | Platte | F. C., Irr., P. |
| Rio Grande | New Mexico | Rio Grande | Irr., P. |
| Colo.-Big Thompson | Colorado | Blue | Irr., P. |
| Colo.-Big Thompson | Colorado | Big Thompson | Irr., P. |
| Parker | Ariz.-Calif. | Colorado | W. S., Irr., P. |

| Name of Plant | Year Initial Operation | Initial Capacity KW | Initial Capacity No. of units | Ultimate Capacity KW | Ultimate Capacity No. of units |
|---|---|---|---|---|---|
| Boulder | 1936 | 704,800 (2) | 11 (3) | 1,322,300 | 19 (4) |
| Grand Coulee | 1941 | 344,000 | 5 (5) | 1,974,000 | 21 (6) |
| Shasta | 1942 | 304,000 | 4 (7) | 379,000 | 5 (8) |
| Seminoe | 1939 | 32,400 | 3 (9) | 32,400 | 3 (9) |
| Elephant Butte | 1940 | 24,300 | 3 (10) | 24,300 | 3 (10) |
| Green Mountain | 1941 | 21,600 | 2 (11) | 21,600 | 2 (11) |
| 1, 2, 3, 4, and 4A | (12) | (12) | (12) | 105,000 | (12) |
| Parker | 1941 | 90,000 | 3 (13) | 120,000 | 4 (14) |

(1) F.C.=Flood Control; Irr.=Irrigation; P.=Power; W.S.=Water Supply.
(2) As of January 1, 1940
(3) 8—82,500 KW; 1—40,000; and 2—2,400 KW.
(4) 15—82,500 KW; 2—40,000; and 2—2,400 KW.
(5) 3—108,000 KW; 2—12,500 Kv-a at 0.8 p.f.
(6) 18—108,000 KW; 3— 12,500 Kv-a at 0.8 p.f.
(7) 4—75,000 KW; 2—2500 Kv-a at 0.8 p.f.
(8) 5—75,000 KW; 2—2500 Kv-a at 0.8 p.f.
(9) 3—12,000 Kv-a at 0.9 p.f.
(10) 3— 9,000 Kv-a at 0.9 p.f.
(11) 2—12,000 Kv-a at 0.9 p.f.
(12) 5 plants installed in approximately 1944 to 1965.
(13) 3—30,000 KW.
(14) 4—30,000 KW.

sold, and approximately 332 mi. of these are being dismantled.

The principal activity involving electrical work during 1940 will be the construction of a water-softening plant in the distributing system near La Verne. Electrical facilities will cost about $180,000. The main aqueduct pumping plants will be in regular operation.—*Julian Hinds, assistant chief engineer.*

## Nevada-California Electric

Expenditures for new and improved facilities last year were $729,700. The same items in the proposed 1940 budget total $1,148,505. Principal increases are in production, transmission and distribution categories and consist generally of modernization. Principal addition will be in transmission.

Last year's work on generating facilities consisted mainly of converting a hydro plant to semi-automatic control. Transmission expenses amounting to $92,300 went principally for acquiring 35 mi. of constructed 66-kv. line (to be re-insulated for 88-kv.), for building 3½ mi. of connecting line, and for reconstructing 4¼ mi. of 55-kv. line. Distribution additions totalled 10 mi., while rebuilding and modernization amounted to $112,500. Substation transformers were increased by 2,500 kva.

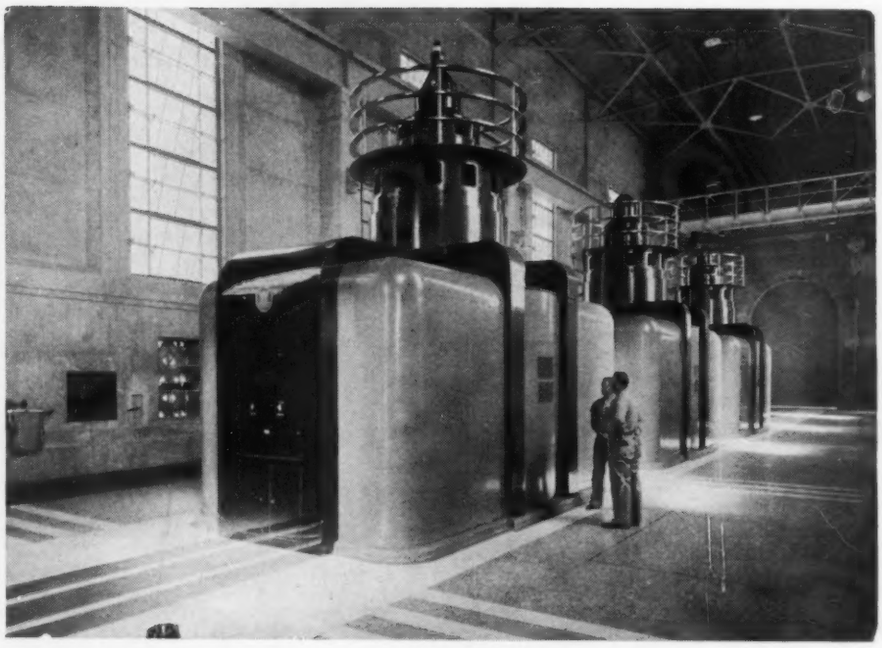
The 1940 program provides for no new generation but contemplates $81,000 mainly for semi-automatic features at one plant, for improving generator breakers and bus facilities, and for increasing feeder capacity. Transmission improvements totalling $195,000 include acquisition of 44½ mi. more of constructed line, as described above, and constructing 8 mi. of connecting line. Distribution additions are expected to be about 23 mi., while modernization is expected to cost $161,300.

Substation items include $27,300 for regulating equipment and $27,700 for breaker replacement or modernization, exclusive of that mentioned above under generation.—*R. H. Halpenny, electrical engineer.*

## Pacific Gas and Electric

Construction activities of Pacific Gas and Electric Co. for 1940 will, in large measure, follow the pattern of the past few years. Specifically, the 1940 budget estimates may be broken down as follows:

| | |
|---|---|
| Hydroelectric production | $ 2,341,313 |
| Steam-electric production | 214,845 |
| Transmission | 2,043,251 |
| Distribution | 11,101,314 |
| Total | $ 15,700,723 |



METROPOLITAN WATER District of So. Cal. will eventually be Boulder's biggest customer. Last year it began taking energy, and these 12,000-hp. pump motors at Iron Mtn. went into service

These figures do not include a carryover from the 1939 budget of some $15,500,000, remaining to be expended, largely in connection with the completion of the three steam-electric plants now under construction.

### 1939 Program

PRODUCTION—Although no new generating capacity was actually added to the system during the year, very active construction programs were carried forward on the two 50,000-kva. steam plants at Avon and Martinez, and a start made on the third plant of the same capacity at Oleum. Two are scheduled for completion during 1940 and the third in 1941, all at a combined cost of some $15,000,000. This additional 150,000 kva. of generating capacity in steam will be particularly acceptable in a year which bids fair to be of less than normal precipitation.

Reconstruction and replacement work on three small hydro-electric generating stations (Potter Valley, Phoenix, and Junction City) in progress during the latter half of the year, will result in 9,500 kva. of modernized generating capacity, a slight increase over capacity of the old units. At Potter Valley and Phoenix, full automatic equipment is being provided, while at Junction City the operation will be semi-automatic.

During the year, the third and last section of Stanislaus tunnel was completed, resulting in the final replacement of some 15 mi. of timber flume with 11 mi. of tunnel. This not only makes for greater reliability in the supply of water to the Stanislaus plant, but effects a substantial reduction of water losses. Upon completion of Stanislaus tunnel, the same operation was begun in connection with the Colgate plant, where 4½ mi. of tunnel will replace 7½ mi. of timber flume, at a probable cost of $1,420,000.

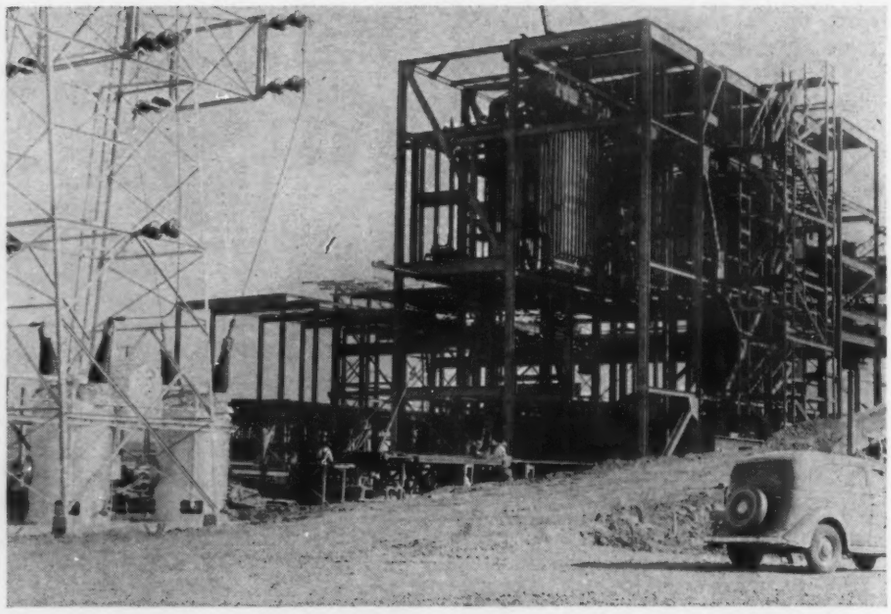
TRANSMISSION—The item of major interest in the transmission field was the completion of 48 circuit mi. of 220-kv. tower line between Contra Costa Substation and Livermore—a link in the transmission outlet for the new Avon and Martinez steam plants. Although constructed for 220-kv. operation, at such time as the Vaca Dixon-Newark lines are raised to that voltage, this section will be operated for the present at 110-kv.

A new 70-kv. transmission line 28 mi. long was constructed between Santa Maria and Zaca in Santa Barbara County. Another 70-kv. line was extended from Coppersmith substation to the Friant dam site.

Advantage was taken of the favorable weather season to complete the final 20 mi. of the 60-kv. line between Drum and the Summit metering station, tying into the Sierra Pacific Power Co.'s system at the latter point. This completed the second line, furnishing duplicate service to Sierra Pacific. A 60-kv. circuit, 7 mi. in length, was constructed to serve the Permanente Cement Plant near Los Altos.

DISTRIBUTION—In the distribution field, considerable substation work in response to growth of load, is to be reported. Eleven new distribution substations, stepping down from 60 kv., of a combined capacity of 45,000 kva., were installed. Seven others were converted to full automatic operation. Some 20,000 kva. of capacity were added to existing stations, and major changes not involving a change in capacity, were made at nine other points.

In the lower voltage classes, a number of new distribution substations were installed, and many exchanges of transformer banks effected, as a means of meeting load growth. While none of these was large, they required the expenditure of considerable sums in the aggregate. At the close of the year, Station T, Berkeley, is well along toward completion. This is a 12/4-kv. substation of 8,000-kva. ultimate capacity, serving a growing residential and commercial area. Two 2,000-kva., unit-type substations, installed in suburban areas, indicate the growing utilization of that type of equipment to meet specific situations promptly and economically.



BOILERS at PG and E's Avon, oil refinery plant which is scheduled for completion this year

### 1940 Program

PRODUCTION — In addition to the completion of the three major steam-electric plants, which is of primary importance, plans are in process for several hydro-electric installations involving reconstruction or expansion, toward which a start at least, will be made during the coming year.

TRANSMISSION—As suggested above, the 150.000 kva. of new steam capacity situated along the bay shore in Contra Costa County, will necessitate the construction of a number of miles of 110-kv. transmission lines to convey that energy into the main transmission system and toward the metropolitan load centers to the south. One such line, from the Oleum plant to the existing Claremont-Newark line, will cost to the order of $150,000. Another line, tying the Avon and Martinez plants into Newark substation by way of Conta Costa substation and including the 48 circuit mi. of line, constructed to Livermore last year, will require the expenditure of $1,212,000. In all, a total of 150 circuit mi. of double-circuit, 110-kv. transmission lines will be needed. Additional switching equipment, with improved rupturing capacity, at both the Contra Costa and Newark substations will involve $240,000 for equipment in place.

The construction of several transmission substations of considerable capacity is planned for next year. One at San Mateo, including a 50,000-kva., 110/60-kv. bank and a 25.000-kva. synchronous condenser, will improve the power supply to the Peninsula from Palo Alto to South San Francisco. Its cost is estimated at $762,000.

Several services of considerable capacity will be required for rather large concentrated loads. One providing for increased deliveries to the Great Western Electro-Chemical Co. will cost $305,000. Another to serve the NACA laboratory at Moffett Field will require a 110-kv. connection which, with the re-routing of existing lines in the vicinity, will cost some $200,000.

DISTRIBUTION—Throughout the system, additional distribution facilities will be provided to carry normal load growth. In San Francisco, the installation of 11-kv. network feeders and related equipment will be continued from last year. A duct supply line, leading from Martin Substation northward, will be a preliminary step in bringing more energy into the city load centers. In Station X, Oakland, 12-kv. buses will be rebuilt and the main transformer equipment will be rewound at a cost of $500,000.

In every division of the system will be found many new distribution lines of 22 kv. and below, extending into developing territories and increasing the deliveries into the older sections. In connection with these, will also be a number of smaller distribution substations, in the aggregate totaling to considerable sums.

### Trends

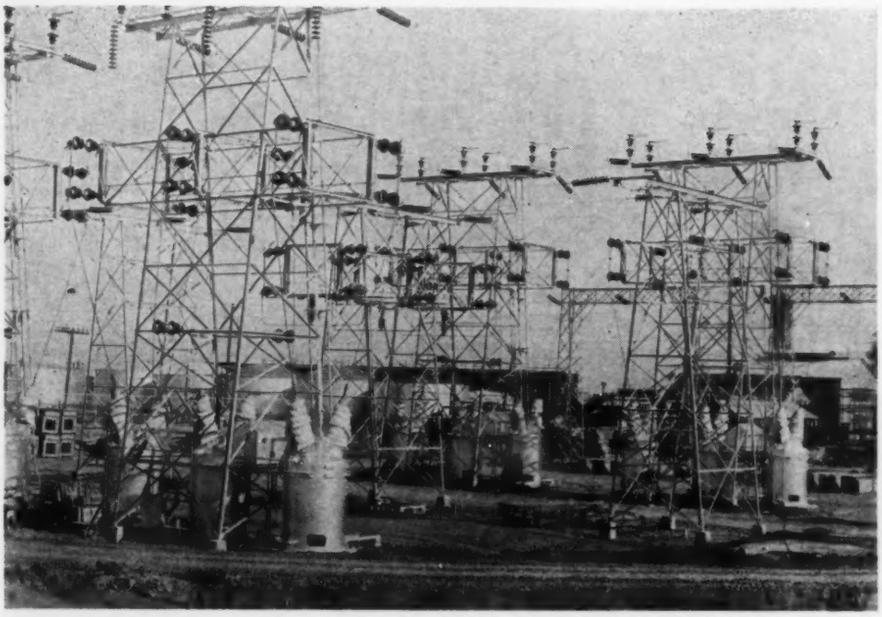
In the production field, the older hydro-electric stations being modernized indicate a continuing trend toward automatic operation, which has been found to be justified by increased operating efficiencies and economies.

In the distribution field, two outstanding trends are to be noted. Considerable effort is to be observed toward the improvement of power factors through the introduction of rotary condensers and static capacitors at advantageous points. It is obviously more economic to secure increased capacity from existing facilities by such means, than to undertake the construction of new and enlarged facilities. In the more congested load areas, a trend toward the installation of network systems is apparent, as a means of relieving the loads on existing substations and meeting new load growth wherever it occurs.

The increases now being found necessary in the distribution field generally, emphasize what may well be the first marked steps toward the renewal of load growth at the rates to which the electric industry was accustomed in the years prior to 1929—and with that growth, a renewal of expenditures of the magnitude required in those more active years.—*A. H. Markwart, vice-president in charge of engineering.*

## Palo Alto Electric Dept.

Palo Alto operates on a fiscal year ending June 30. Capital expenses for 1938-39 were $23,309 Budgeted for similar additions for 1939-40 is $25,000. Principal 1938-39 expenditures were:



BUS-SECTIONALIZING SWITCHES for handling at 115 kv. the 35,000 kw. the plant will turn out

| | |
|---|---|
| Poles and accessories | $5,954 |
| Overhead conductors | 4,639 |
| Transformers | 2,328 |
| Services | 3,505 |
| Meters | 3,778 |

Summary of 1940: (a) About 3-mi. of lines to be rebuilt or added. (b) Expenditures expected are for transformers $2,500, and meters $4,500. (c) Residence consumers will probably increase steadily.—*A. V. Youens, electrical engineer.*

## Pasadena Municipal L & P

Aside from normal extensions to the distribution system, the only major job of 1939 was the construction of an induced-draft condenser-water cooling tower at our steam plant. The 1940 budget has not yet been approved, but no major construction is expected, except for that to take care of normal growth, which is estimated to approximate that of last year.—*B. F. Delanty, general manager and chief engineer.*

## San Diego Consolidated

Capital expenditures during 1939 amounted to $1,920,000. Our 1940 budget contemplates the investment of $2,490,000.

Our 1939 improvements did not include any additional generating facilities. However, we installed, at steam Station B, a building extension to house additional 12-kv. switchgear. The building has now been completed, and the oil switches, which are of the most modern type, housed in individual steel cubicles, will be in operation shortly. Cost of this extension was $535,000. Other improvements in 1939, besides usual line extensions, involved increasing transformer capacity and additional switchgear at several of the company's city and suburban substations, including Substation F, Cornado, La Mesa, La Jolla, and Oceanside.

The 1940 program contemplates either initial expenditures for an additional steam generating unit, or an increase in interchange facilities. A decision respecting these alternatives has not yet been reached. Aside from this the major investments will cover substation enlargements, particularly at Point Loma, La Mesa, and Fallbrook; and the usual distribution expenditures. We expect to make even more widespread use of distribution capacitors than in 1939. During the annual peak period just past, capacitors were employed in a number of situations on short notice to improve both line and substation conditions, especially at points where the load growth had reached figures substantially beyond those estimated when the year's improvements were outlined in the spring. —*L. M. Klauber, vice-president in charge of operation.*

## Southern California Edison

During 1939, approximately $6,500,000 were spent for transmission lines, substations, distribution equipment and general system improvement. Our budget for 1940 contemplates an expenditure of approximately $7,500,000.

In June 1939, the first 82,500-kw. generator at Boulder was put in service, delivering energy to the Edison system through Chino substation. This line and substation were completed the latter part of 1938. In the early part of 1939, appreciating that we were going to have a dry year which would require furnishing large quantities of energy from our Long Beach steam plant, we decided to construct a 220-kv. transmission line from Chino to the Barre substation site, build the substation at Barre and install 75,000 kva. transformer capacity.

Installation of the two machines at Boulder had been planned so that one would follow the other in order to make a continuous construction program. Work on the second unit had progressed to such a point that when the situation was presented to the Bureau of Reclamation they were able to speed up completion of this unit, so that by the latter part of September the second generating unit at Boulder, extension of the transmission line and Barre substation went into service, making an additional 82,500 kw. of capacity available.

In addition to Barre substation, five new distribution stations were constructed during the year which, together with some minor additions to existing stations, increased the distribution system capacity by 25,000 kva.

The relay modernization program which was started in 1938 was continued through 1939. A number of 66-kv. oil circuit breakers were modernized to increase their interrupting capacity and speed up the time of opening.

A 10,000-kva. condenser was installed at Santa Barbara to improve voltage regulation in the Santa Barbara and Ventura County areas.

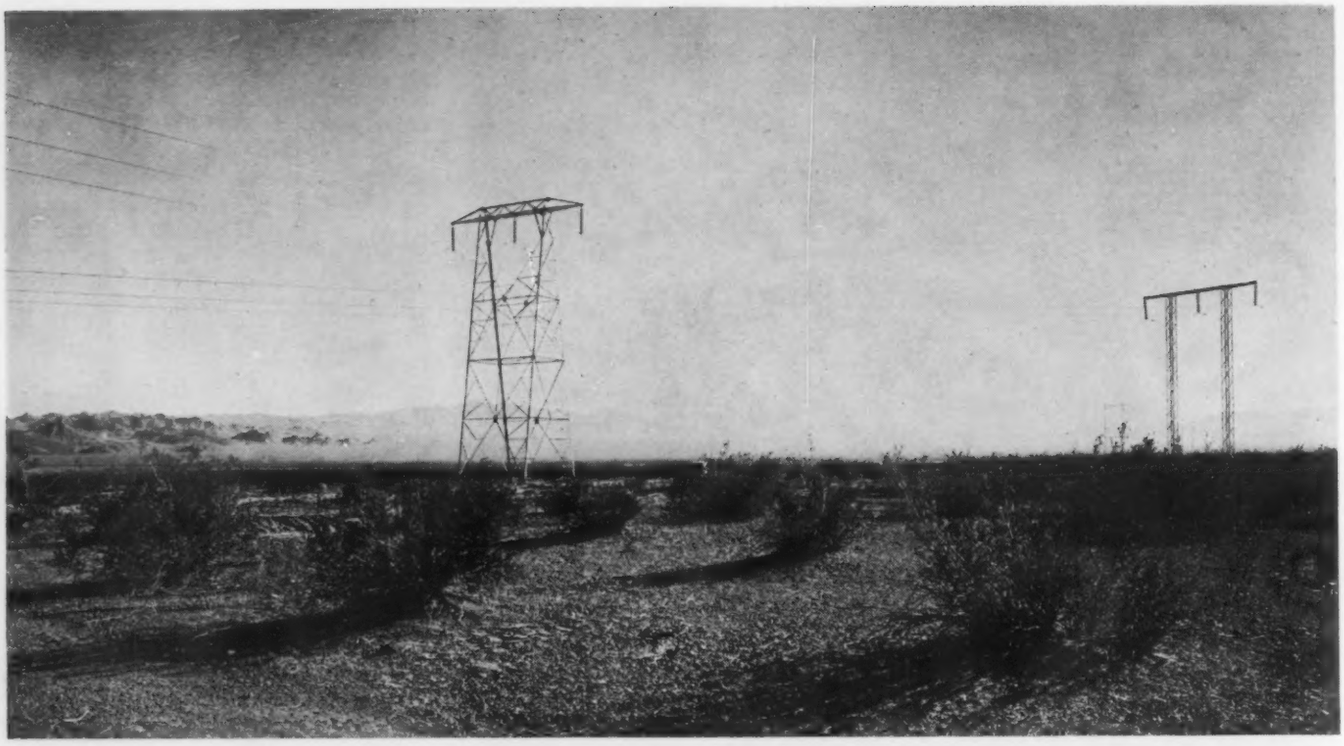
### 1940 Program

A 50,000-kva. condenser will be installed at Barre substation in 1940 as originally contemplated. No additional generating capacity will be added in 1940 as the second unit at Boulder was placed in service in advance of its original schedule.

The construction of four new distribution substations is planned. These, together with additions to existing stations, will increase the distribution substation capacity by approximately 25,000-kw.

Approximately 27,000 new consumers were added to the system in 1939 and it is estimated that 30,000 will be connected in 1940.

There has been a great deal of activity in the building of new homes, as shown by the number of new consumers added during 1939. Indications are that this will not only continue but



BOULDER POWER reached southern California last year by way of Edison's new 220-kv. circuit. Here it crosses Nevada California Electric's line

may increase slightly. This activity is distributed quite uniformly throughout the territory and much of this business is taken on as saturation to existing lines and substations. This necessitates the reinforcement of distribution substations and feeders. Southern California has become one of the important airplane manufacturing centers and practically all of the plants have required large additions to their electrical equipment, and one new plant is in the process of construction.—*N. B. Hinson, chief engineer.*

### Turlock Irrigation District

Construction last year was minor. Only a few routine extensions of the 11 and 4-kv. distribution lines were made; the total probably will not exceed $50,000. The budget for 1939-40 has been set at $53,000. No generation or transmission was undertaken, nor scheduled for the coming year. There will probably be come capacitor additions but studies of amount, etc., are not completed at present.—*L. H. Parker, electrical engineer.*

## Colorado

### Big Thompson Project, USBR

Construction of the Green Mountain Dam and power plant is in progress. The turbines and generators are in process of manufacture and will be ready for installation in 1941. Eighty-five miles of 110-, 66-, and 44-kv. transmission lines were constructed for the delivery of construction power, and for the future transmission of energy from the power plants.

### Colorado Springs PU Dept.

In 1939 we spent approximately $532,000 in improvements to our electric system. The greater portion, about $463,000 was used for a new penstock and water-wheel-generator unit, replacing worn out equipment, for our Manitou hydro plant. The penstock is somewhat unusual in that static is 2,420 ft. The remaining $69,000 was for ordinary additions and betterments consisting mostly of short extensions, additional transformers, outdoor meters, etc.

For 1940, the total budget is $130,000 for additions to property: $65,000 for ordinary additions, mostly to the distribution system; $10,000 for rebuilding distribution lines and installing reclosing switches; $35,000 for increasing capacity on the tie line between our steam and hydro Plants. The remaining $20,000 is distributed among a number of small improvements.—*F. H. Wiley, superintendent, Electric Dept.*

### Public Service of Colorado

New construction in 1939 totaled $870,000, a considerable reduction below that in recent years when generating capacity additions were in progress. Improvements were made in high-speed relaying on a portion of the transmission network, and switchgear rebuilds were carried out at several plants and substations.

Similar routine expenditures during 1940 will amount to $680,000, and are confined largely to reinforcement and rearrangement of existing facilities. No generating additions are scheduled.

At Valmont, the company's largest steam generating plant, installation of new and improved dust removal equipment is in progress; two major 100/13-kv. transformer banks at the Denver Terminal will be re-wound for greater capacity and higher voltage; about 20 mi. of 100-kv. transmission line will be reconductored; while several transformer capacity reinforcements are contemplated on the 44-kv. system serving northern Colorado. It is possible that one new distribution substation, not included in the above total amount, may be added in Denver.

An interconnection with the new transmission system of the Kendrick Project of the U. S. Bureau of Reclamation was completed in 1939, and it is anticipated that some secondary energy will be available to the company from that source during 1940.

Satisfactory load growth was experienced in 1939, the Central System peak showing an increase of 8% over the previous year. A 5% increase in peak load is anticipated for 1940 over 1939,

with a corresponding increase in net generation. —*Guy W. Faller, vice-president and general manager.*

### Southern Colorado Power

Our construction budget for 1939 was $160,159. That for 1940 is $1,196,200. The expenditures for 1939 by items were as follows:

| | |
|---|---|
| Steam Plant | $ 2,000 |
| Transmission | 16,000 |
| Distribution | 109,000 |
| Substations | 8,829 |
| Street Railway | 15,000 |
| Automotive Transportation | 9,300 |

The 1939 budget did not include any major improvements. The largest item, Distribution, covered a large number of small line extensions, mainly under the heading of new business.

The 1940 construction budget is itemised as follows:

| | |
|---|---|
| Generation | $1,004,200 |
| Buildings | 25,000 |
| Transmission | 13,000 |
| Substations | 27,000 |
| Distribution | 118,000 |
| Street Railway | 4,000 |
| Automotive Transportation | 5,000 |

The first item covers an addition to the Pueblo steam plant, requiring a 50-ft. addition to the present building, and the installation of a 7,500-kw., 3,600-rpm., 3-phase, 60-cycle, 2,300-volt, steam turbine unit; 400 lb. gage, 750°F.

The next largest item, distribution, covers a large number of small line extensions under the heading of new business.

The most important trend bearing on 1940 activities in this district will be due to activity of the Colorado Fuel and Iron Corp., a large steel manufacturing plant, which has extensive business due to the demand for steel; also, increased activity in agriculture and mining.—*M. G. Lord, vice-president in charge of operation.*

### Trinidad Electric

During 1939 no new generating equipment was installed and none is budgeted for 1940. Some 23 mi. of rural lines were installed for approximately $40,000. About $20,000 was spent for improvement of existing facilities, and about $10,000 is budgeted for 1940 for the same purpose. The bulk of our load comes from coal mining operations, and we do not foresee any great increase at present. We plan to revamp distribution to get better voltage control.—*R. T. Armstrong, power production superintendent.*

## Idaho

### Idaho Power

The present estimated construction expenditures for 1940 are $1,300,000, approximately the same as for 1939.

Last year a 300-kw. diesel generator was installed at Salmon. No transmission was constructed. Distribution included 300 mi. of 2,300- and 12,000-volt lines added, bringing in 950 new farm customers. In addition, 125 mi. of 2,300- and 4,000-volt lines were cut-over to 12 kv., and approximately 12 mi. of city feeder lines were constructed and modernized. New curb street lighting systems were added in seven towns.

A number of improvements were made to substations as follows: 12-kv. feeder switching facilities at Blackfoot substation were modernized and a 100-kva., 3-phase, step-type voltage regulator added. A 2,000-kva. substation was constructed at Buhl. A 1,000-kva. rural substation was constructed near Melba. Capacity of Jerome substation was increased from 1,500 to 2,500 kva.; Vale from 600 to 1,000 kva; Huntington from 300 to 600 kva.

A 150-kva. substation was constructed for Rio Grande Copper at Mountain City, Nev.

Feeder regulators were installed at American Falls, Pocatello, Inkom, Springfield, Fairview, Fort Hall and Boise substations.

The two substations at Caldwell were combined to complete work started in 1938, providing 12 kv.

Outstanding jobs of the year were the improvements at Caldwell substation and the large increase in rural distribution. The work at Caldwell brought the control of one 132-kv. line, four 66-kv. lines and two 44-kv. lines under operators at one point. All lines are equipped with automatic reclosing oil circuit breakers with facilities for checking synchronism before reclosure. This station is now equipped with 3,000 kva of condenser capacity and 10,000 kva of reactance.

**Summary of 1940**

Voltage of the transmission line from Thousand Springs plant to Jarbridge and Mountain City mining districts will probably be raised from 44 to 66 kv. Some old Tamarack poles will be replaced with treated cedar.

We expect to build 200 mi. of rural distribution. The distribution system in the city of Nampa may be modernized.

A new 6,000-kva. substation is planned at Nampa. It will be the junction for three 44-kv. transmission lines and will serve five 12-kv. feeders.

At Boise, a new 3,000-kva. substation is planned. At Twin Falls substation, equipment for two additional 12-kv. feeders will be installed, and the 4-kv. feeder oil switches, both here and at Pocatello, will be replaced larger.—*H. L. Senger, chief engineer.*

### Minidoka Project, USBR

Award of contract for an additional generating unit of 6,000 kva. was made during 1939. This, the seventh generating unit in Minidoka plant, will be placed in operation early in 1941. Power from this unit will be supplied to the Milner Low-Lift Irrigation District and surplus will be sold temporarily to Idaho Power Co. until such time as required to meet the increasing demands for power on the Minidoka Project.

## Montana

### Montana Power

Our 1940 construction budget totals $2,250,000 but does not contain any major items of power plant or transmission line construction.—*H. H. Cochrane, chief engineer.*

## Nevada

### Boulder Project, USBR

During 1939 two 82,500-kva. generating units were added, bringing total installed capacity to 704,800 kw. Energy production is now at the rate of over 300,000,000 kw.-hr. per month. Installation of two additional 82,500-kva. units is in progress. Operation of these units is expected early in 1941.

### Sierra Pacific Power

In the Electric Department, this company's 1939 construction expenditures were about $375,000. The 1940 budget is not yet approved, but tentative plans indicate the figure will be $175,000. Although the proposed figure is thus considerably less than for 1939, the budget for all departments will be about the same because of a relatively heavy program for the Water Department.

Last year's program included construction of 4½ mi. of 23-kv. line, 5½ mi. of 13-kv. line, 3 mi. of 60-kv. line, construction of a new warehouse at Reno. Miscellaneous additions and improvements accounted for $129,000.

This year's activities will include rebuilding the 23-kv. switchyard and replacing six transformers totalling 4,750 kva. at Washoe power plant, 60-kv. arresters at Portola and Lovelock substations. Distribution additions are expected to be much like those of 1939. —*V. D. Armstrong, engineer.*

# New Mexico

## Albuquerque G & E

During 1939 we spent $280,000 in the electrical department for capital expenditures. For 1940 we have budgeted $160,000 for this purpose. The reason for the difference in these amounts is the fact we installed a 2,500-kva. turbo-generator in our Bernalillo plant in 1939.

This was the principal item for 1939. The balance took care of normal distribution system expansion, such as meters, transformers, line extensions, etc.

The only major item we have budgeted for 1940, outside of regular blanket distribution expenditures, is the first unit of a 22-kv. belt line around the city to relieve our distribution feeders. This will include a new step-up substation at the power house, about 10 mi. of 22-kv. line and three step-down substations. This item will cost about $70,000 and will include 3,000-kva. in step-up transformer capacity and a like amount of step-down capacity.

Albuquerque has been growing very rapidly as shown by the fact that the number of customers increased 13.5% over the previous year and our installed kva. in distribution transformers increased 12.5%. The city also experienced its peak year in building activities. All indications point to a comparable year for 1940 which is reflected in the heavy reinforcement of our distribution system as budgeted for this year.—*Arthur Prager, vice-president and general manager.*

## Rio Grande Project, USBR

Construction of the power plant building at Elephant Butte Dam was completed in 1939. The installation of three 9,000-kva. generating units is in progress with operation scheduled for the spring of 1940; 180 mi. of 110-kv. transmission lines between the Elephant Butte power plant and Las Cruces and Silver City will be completed in 1940.

### Bonneville Transmission System

| From | To | Ct. Mi. | Conductor | Const. Voltage | Initial Operation Voltage | |
|---|---|---|---|---|---|---|
| Bonneville | No. Bonneville | .6 | 801,900 CM ACSR | 230 | 115 | (y)* |
| Bonneville | No. Bonneville | .6 | 801,900 CM ACSR | 230 | 115 | (y)* |
| No. Bonneville | No. Vancouver | 36.8 | 795,000 CM ACSR | 230 | 115 | (y)* |
| No. Bonneville | No. Vancouver | 36.8 | 795,000 CM ACSR | 230 | 115 | (y)* |
| No. Bonneville | Grand Coulee | 233.7 | 795,000 CM ACSR | 230 | 230 | ‡ |
| Vancouver | St. Johns (Excl. Xing) | 4.8 | 350,000 CM cu. | 115 | 115 | (y)* |
| Vancouver | St. Johns (Excl. Xing) | 4.8 | 350,000 CM cu. | 115 | 115 | (y)* |
| Columbia-Willamette | River Crossing | 2.9 | 801,900 CM ACSR | 230 | 115 | (y)* |
| Columbia-Willamette | River Crossing | 2.9 | 801,900 CM ACSR | 230 | 115 | (y)* |
| St. Johns | Oregon City | 23.4 | 350,000 CM cu. | 115 | 115 | * |
| Oregon City | Salem | 34.2 | 250,000 CM cu. | 115 | 115 | * |
| Salem | Eugene | 62.4 | 397,500 CM ACSR | 115 | 115 | * |
| Vancouver | Kelso | 41.2 | 795,000 CM ACSR | 230 | 115 | ‡ |
| Kelso | Chehalis | 30.1 | 795,000 CM ACSR | 230 | 115 | A |
| Chehalis | Raymond | 45.5 | 250,000 CM cu. | 115 | 115 | ‡ |
| Chehalis | Renton | 77.0 | 795,000 CM ACSR | 230 | 115 | A |
| Bonneville (Excl. Xing) | Hood River | 22.0 | 250,000 CM cu. (x) | 115 | 115 | A |
| Canal Crossing | | .6 | 795,000 CM ACSR | 115 | 115 | ‡(a) |
| Hood River | The Dalles | 16.1 | 250,000 CM cu. | 115 | 69 | A |
| Bonneville | Cascade Locks | 4.2 | No. 2 H. D. cu. | 13.8 | 13.8 | * |

NOTE: Circuit mileage of lines subject to relocation of substations. November 29, 1939.
* Completed
‡ Under Construction
(a) Under Construction as of Jan. 1/40
(x) One 2,700-ft. span of 795,000 CM ACSR
(y) To be operated at 57 Kv. until Feb. 1/40
A Authorized
(See also Electrical West, January 1940, Table II.)

### Bonneville Substations

| Name or Location | Transf. Kva. | Arrangement | Voltages | |
|---|---|---|---|---|
| Vancouver | 75,000 | Star-Star | 230/115 | ‡ |
| North Bonneville Switching Station | | | 230/115 | ‡ |
| Midway Switching Station | 50,000 (x) | Star-Star | 230/115 | A |
| St. Johns | 30,000 | Star-Delta | 115/69 | ‡(b) |
| St. Johns | 60,000 | Star-Star | 115/57.1 | ‡(b) |
| Salem | 30,000 (x) | Star-Star | 115/57.1 | A |
| Eugene | 12,000 | Star-Delta | 115/11.5 | * |
| Raymond | 12,000 | Star-Delta | 115/66/22 | ‡ |
| Hood River | 7,500 | Star-Delta | 115/66 | ‡ |
| South Bank (Rating 20,000 KW) | | | | |
| Ellensburg (Y) | 7,500 (x) | Star-Delta | 115/34.5 | (x) |

* Nearly Completed
‡ Under Construction
(b) Interchangeable
A Authorized
(x) Tentative Rating
(y) Engineering only authorized

# Oregon

## Bonneville Project

Congress and other federal agencies furnish the necessary funds for operations which are, therefore, based on designs for a fiscal year ending June 30. The 1939 program was financed by an appropriation of $3,500,000 from Congress and a grant of $10,750,000 from PWA, the latter for both 1939 and 1940 construction. Congress voted $13,000,000 for the 1940 program. The scope of operations is accordingly somewhat greater for 1940 than for 1939, both being dependent on available money.

For all practical purposes construction activities of this organization started in the early summer of 1938. Since then the system has been planned, and surveys have been completed for 342 mi. of 230-kv. line and 213 mi. of 115-kv. line. Surveys have been started on 267 mi. of 230-kv. line and on 268 mi. of 115-kv. line. The status of the transmission system appears in the table.

Substations have kept pace with transmission lines. Two substations are virtually completed, and construction is proceeding on three others, including the major substation at North Vancouver. Construction on five other substations will start as soon as materials are delivered. These data are likewise tabulated.

### 1940 Program

The 1940 program provides for continuing construction on incomplete work and for constructing additional facilities. The 77-mi. Chehalis-Renton 230-kv. line, the 32-mi., 115-kv. Yakima-Ellensburg line, the 55-mi. Bonneville-Oregon City line, and the 87-mi., 115-kv. St. Johns-Astoria line, are scheduled for construction. Survey work and engineering are also anticipated for a 230-kv. line between Spokane and Grand Coulee Dam.

A number of low-voltage lines will probably also be constructed to serve small load areas adjacent to substations. In addition to the five substations awaiting materials, construction on two other substations will probably start during the year. Preliminary surveys and engineering are projected for three other substations.—*S. E. Schultz, acting chief engineer.*

## California Oregon Power

A construction budget of $1,014,000 has been approved, a figure which compares with $722,000 budgeted for similar work a year ago. Largest single item, $150,000, is for new transmission—a line from Medford to Grants Pass.

As was the case last year, major part of the money will be spent on transmission and distribution additions and improvements throughout the whole of the system.

Principal jobs scheduled for 1940: rebuild line from Prospect to Gold Ray, $30,000; rebuild Gold Ray Dam.

Rogue River, $38,0000; new switching stations near Klamath Falls, $64,000. —*J. C. Boyle, vice-president in charge of operation.*

## Eastern Oregon L & P

Our system improvements last year approximated $100,000, while our 1940 budget, which is of a tentative nature, is $142,000.

Last year's work consisted mainly of building 11 mi. of rural lines, adding 500 kva. of transformers and installing 200 kva. of capacitors. Items in the 1940 budget for the distribution system may total $67,000.

Precipitation for 1939 was far below normal, hence hydro generation was low, but gross generation was up 8%.—*O. D. Lanning, chief engineer.*

## Eugene Water Board

In 1939, fixed capital additions were approximately $155,000. For 1940, $200,000 has been budgeted for new construction, largely for improvements and additions to the distribution system. In addition to this, we have decided to build a steam plant to take care of peak loads. Studies have been made on the basis of a 7,500-kw. unit, estimated to cost approximately $510,000, but a 10,000-kw. unit also is being considered.

Last year saw customers increased by 6.4%, both system peak and total kilowatt-hours sold by 12.7%. To help distribute the increased load, a 5,000-kva. substation was added. This year we will add another substation, probably 1,500-kva. We are scheduled to raise the voltage on one rural feeder and to add several voltage regulators. Most material, not including the generating unit, however, has been placed on order.—*J. W. McArthur, general superintendent.*

## Mountain States Power

During 1939, this company spent roughly $700,000 for new and improved facilities. A like amount is budgeted for 1940. The greatest portion was spent for the extension of rural distribution lines. These are being expanded quite rapidly, especially in the Willamette Valley Division, and such expansion is expected to continue in 1940. Considerable attention to improving existing facilities to take care of increasing loads is also in prospect. No increase in generating capacity is contemplated. About 170 mi. of new lines are scheduled, and transformer additions will approximate 3,800 kva.—*G. McClellan, chief engineer.*

## Northwestern Electric

We spent approximately $340,000 in 1939 for property additions. Gross property additions budgeted for 1940 amount to $423,000.

The increase is due principally to increased distribution line work expected to result from improved business conditions. Larger items in the 1940 budget are: construction of a 66/11-kv. substation at Washougal, Wash., $20,000; increase in 11-kv. transformer capacity in Portland downtown underground vaults, $13,000.

Improvements were minor in 1939. One 600-kva. 11,000/2,400-volt, pole-top distribution substation was installed in Portland, and one 2,400-volt feeder position was installed at Camas substation.

There are no large items budgeted for generating plants and transmission lines for 1940. It is estimated we will build 1 mi. of urban pole line and 8 mi. of rural line during 1940.

We plan to install one new 2,400-volt underground feeder and increase transformer capacity in two underground vaults in Portland. Many of our line transformer changes are made from reserve stock in capital. However, we estimate we will install 2,200 kva. of new transformers. We have only two additions to substation capacity planned for next year, namely, 1,500 kva. for Washougal and 300 kva. for Sellwood in Portland.

In addition to the items mentioned, we have estimated $40,000 more expenditures in 1940 than this year, mostly on line and service extensions and rebuilding existing distribution lines.—*O. L. LeFever, general superintendent.*

## Pacific Power & Light

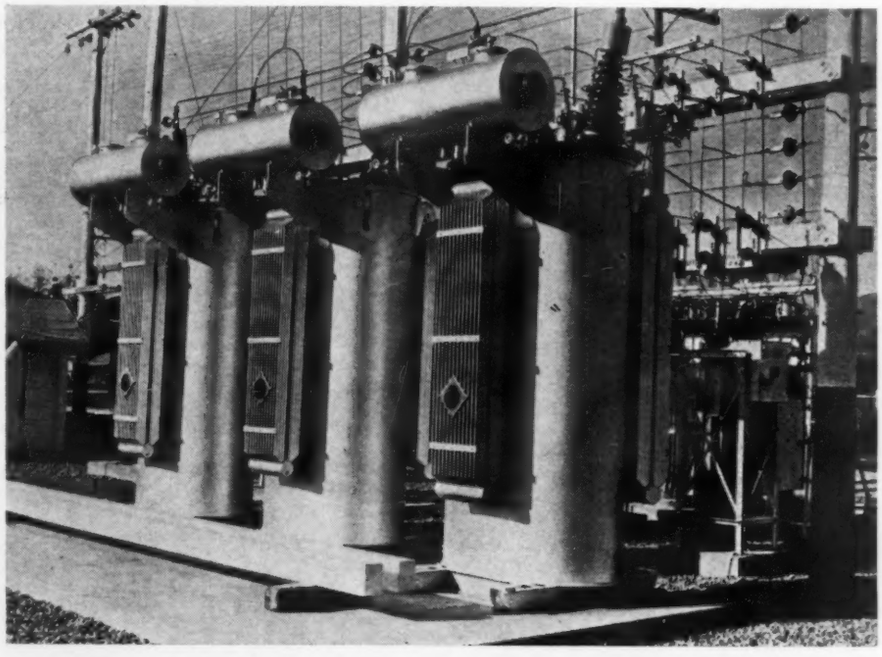
Spent for construction during 1939 was approximately $860,000. The amount for similar work during 1940 will exceed this by a small margin. No major expenditures were made in 1939 for either generating or transmitting facilities.

During 1939 the company spent approximately $194,000 enlarging and strengthening distribution. Extension of service to new customers required an expenditure of $428,000. The exact mileage of rural lines built during 1939 is not yet available but will exceed 100 mi.

Distribution substation facilities for 1939 required an expenditure approximating $156,000. At Walla Walla, Wash., a bank of transformer totaling 3,000 kva. was installed to supply 6,600-volt rural and urban feeders. A 6,900-volt, 3.3-mi feeder was built. A modern 66-kv. outdoor substation was built at The Dalles, replacing indoor switchboard and control equipment to provide for greater load growth. Remaining 1939 expenditures were for transformer enlargements, installation of voltage regulating apparatus, etc.

Construction for 1940 will be mainly substation and distribution improvements and extensions. It is estimated

*Allis-Chalmers Photo*



**SUBSTATION added by California-Oregon Power to improve service to Grants Pass. Three 1,000-kva. transformers serve four 4-wire, 4-kv. feeders. Transmission to the station is 69-kv. grounded Y**

that $245,000 will be spent for strengthening distribution facilities to meet increasing demands. The amount for extension of service to new customers is estimated at $400,000. It is impossible at this time to estimate the amount of rural line which will be built but we believe it will exceed the amount built in 1939. One 16-mi section of 11-kv. line will be rebuilt and operated at 22-kv. to meet growing service demands. Several pieces of voltage regulating equipment are planned. It is estimated that distribution substation expenditures for 1940 will approximate $55,000.

The territory which Pacific company serves is a farming area, and its prosperity depends to a very large degree on the agricultural situation. The year 1940 appears favorable for the grower of grains, livestock and vegetables and uncertain for the fruit raiser. As a whole, we expect our business to expand in 1940 at a rate comparable with with that experienced in 1939.— *H. H. Schoolfield, general superintendent.*

### Portland General Electric

Our construction budget for 1940 totals $1,568,000, and is practically the same as that for last year. The following shows the actual expenditures in 1939 and those budgeted for 1940:

| | 1939 | 1940 |
|---|---|---|
| Steam Plants | $ 12,730 | $ 5,000 |
| Hydro Plants | 62,800 | 123,000 |
| Substations | 314,505 | 468,300 |
| Transmission | 240,820 | 128,600 |
| Distribution | 932,245 | 800,700 |
| Miscellaneous | 69,435 | 43,200 |
| **Total Construction** | **$1,632,535** | **$1,568,800** |
| Maintenance | $ 584,651 | $ 611,400 |

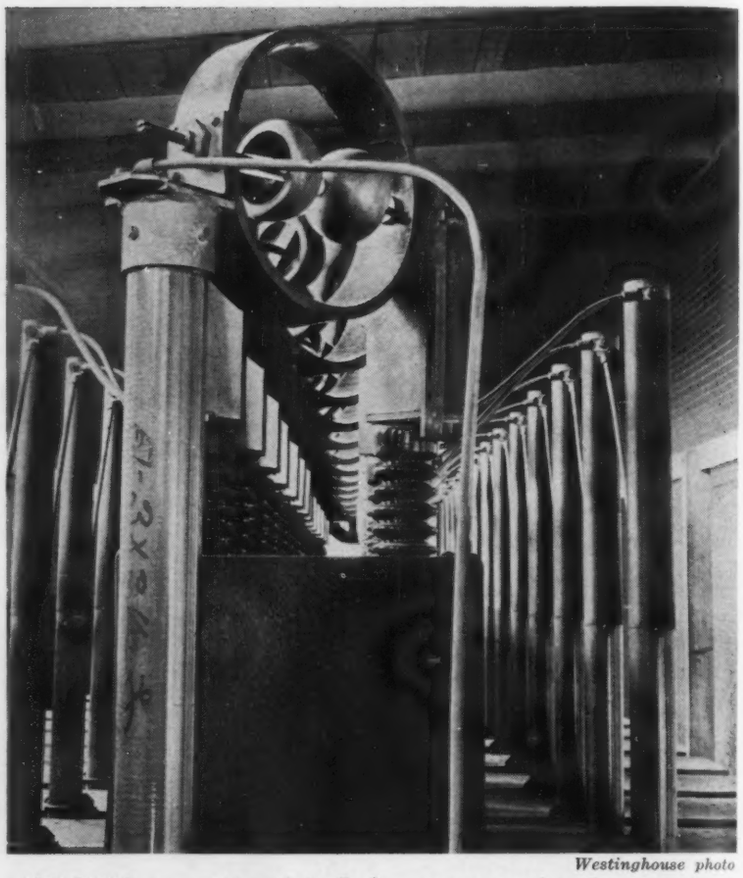
The work covers more or less routine additions, in large part to the distribution substations and general distribution system. There is no single item worthy of any particular comment.— *Walter Brenton, chief engineer.*

## Utah

### Telluride Power

During 1939 we spent about $160,000 for new and improved facilities. Present indications are that the 1940 expenditures will not exceed $50,000 as the work completed in 1939 should take care of our major improvements for the next two or three years.

Principal improvements in 1939 were the construction of a 44,000-volt transmission line about 50 mi. long to connect an isolated property with our main transmission system. We also built 25 mi. of distribution line to supply out-

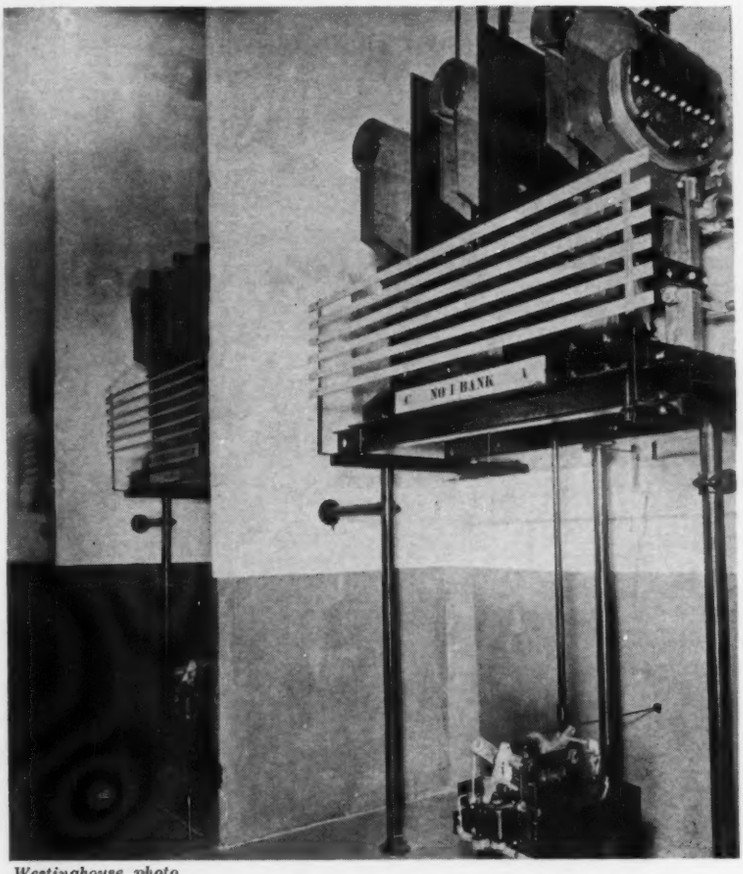


*Westinghouse photo*

**LIGHTNING** is created synthetically from energy stored in these capacitors. The strokes are used for testing self-protected distribution transformers

**A WEB** of paper and aluminum is formed by this machine which winds capacitor rolls. The paper is only 0.0004 in. thick. The foil is even thinner

*G-E photo*

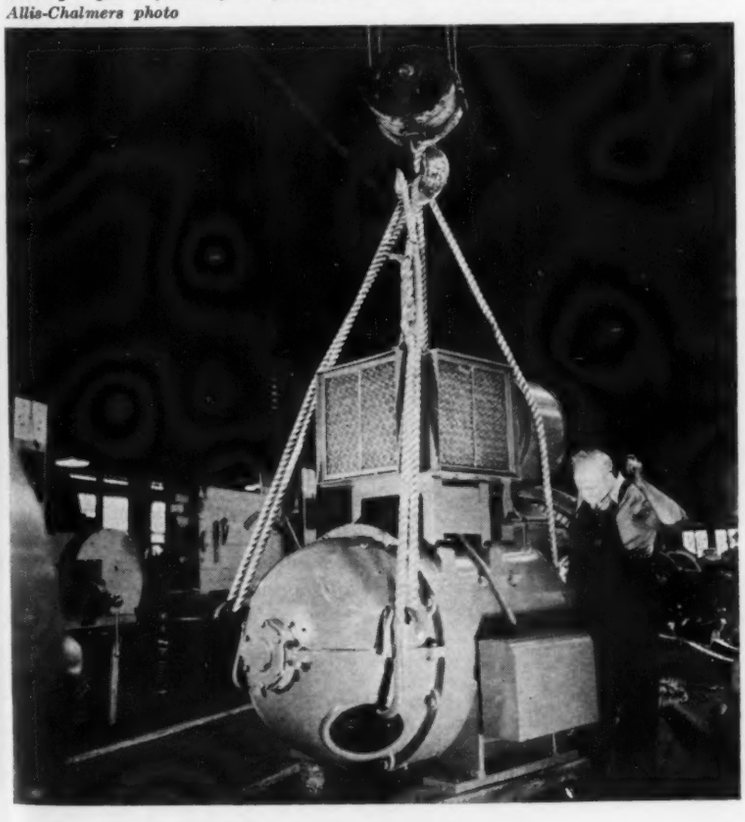


*Westinghouse photo*

**AIR BREAKERS** are attracting more attention. During the past six years, So. Calif. Edison has installed 12 of these 3-phase units on 16-kv. distribution

**GLASS TAPE** provides coil insulation for this 250-hp., d.c. motor, thus permitting higher operating temperature, and, in turn, more power per unit size

*Allis-Chalmers photo*



lying rural areas, and two substations of 100- and 300-kva. capacity.

About the only work contemplated during 1940 is the enlargement and rehabilitation of certain destribution systems that have become inadequate for the load.—*Paul P. Ashworth, chief engineer.*

### Utah Power & Light

Replacements and additions to plant in 1939 amounted to $1,049,000 and are estimated for 1940 at $1,157,000. These figures include those of the Western Colorado Power Co.

Generation required replacing 5,000 ft. of 11-ft. wood-stave pipe last year. Transmission included 8 mi. of new 44-kv. line, while 40 mi. was rebuilt. Distribution facilities were increased by 105 mi. of new line, 6,050 kva. of substation capacity. Besides the foregoing there were numerous additions in line transformers, switching facilities, etc., including services for 3,500 new customers.

The 1940 program contemplates 2,500 ft. of waterway construction; 44-kv. line additions of 5 mi. and reconstruction of 30 mi.; 120 mi. of new distribution line; substation capacity increases totalling 12,750 kva.

Other items will include distribution line improvements, services for new customers, spray pond and treating-tank replacements, meter and line transformer additions.—*L. B. Fuller, chief engineer.*

## Washington

### Columbia Basin Project, USBR

Construction of the left wing of the Grand Coulee power plant building was nearing completion at the close of 1939. Installation of three 108,000-kva. and two 12,500-kva. generating units will begin in 1940 with completion scheduled for 1942.

### Grays Harbor Rwy. & Light

We spent about $20,000 for added facilities in 1939 and have provided $10,000 for similar work in 1940. Practically all local lumber mills have been operating for the past six months. If this situation continues, there probably will be considerable home building in this territory through the year. —*William S. Hill, general superintendent.*

### Puget Sound Power & Light

Construction expenditures for 1939 will be approximately $1,665,000; $2,447,000 is budgeted for 1940. In-

creased amounts will be expended for: (a) additional transformer capacity at various substations stepping down from transmission to distribution voltages; (b) about 28 mi. of added transmission, largely to provide an alternate source of supply for several communities; (c) a number of rural line extensions for which we anticipate increased requests.

There were no outstanding jobs during 1939, about two-thirds of the expenditures having been made for pole replacements and distribution line extensions to serve new customers.

No additional generating capacity is to be installed in 1940, and only routine replacements are scheduled. About 27 mi. of 66-and 55-kv. line are to be built to provide an alternate source of supply to the City of Bremerton. There are also the usual number of pole replacements to result from age and road relocations. About 128 mi. of distribution line extensions are anticipated. About 28,000 kva. of additional transformer capacity will be installed; this will take care of energy needed by existing customers and customers on new extensions. — *Frank McLaughlin, president.*

## Seattle City Light

The Lighting Department's construction budget for 1939 was approximately $1,000,000, including construction on Ross Dam, improvements to substations and distribution system extensions. The 1940 budget will be about the same amount with possibly some additional for system inter-ties and d.c. equipment required by the new Seattle Transit System.

**1939 Program**

Some 5,000-kva. of distribution transformer capacity and 30 mi. of 2,500/4,400-volt primary were added. One substation was changed from 6,000 kva. 2 phase to 9,000 kva. 3 phase; another was increased from 11,250 to 17,250 kva. The 26-kv. tie-line system was rearranged to provide a loop feed to each of these stations. The 26-kv. network was improved by building one new tie-line and by changing the existing equipment to provide more flexible switching facilities.

Pilot-wire relaying protection was added to one 26-kv. tie-line. The 4,400-volt underground network feeders were provided with protective relays to permit simultaneous feeding from two different substations.

**1940 Program**

No new generating capacity is contemplated for 1940, but Ross Dam will be raised to elevation 1380 by the addition of a timber crib for more water storage. The capacity of the Seattle-Tacoma tie-line may be increased by reinsulating for 110 kv.

About 5,000 kva. of distribution transformers and 30 mi. of 2,500/4,400-volt primary will be added. The substation and 26-kv. tie-line improvements begun in 1939 will be continued and two new 6,000-kva. distribution stations will be built. The capacity of another station will be increased by 3,000 kva. Two 165-kv. switching stations will be rearranged and equipment added to increase the transmission line flexibility and reliability.

The trend in 1940 will be toward greater interconnection of power systems for increased capacity and standby service.—*E. R. Hoffman, superintendent.*

## Tacoma Municipal Electric

We have several projects under way which will keep us occupied for a large part of 1940, and no other additions are contemplated at present. Principal items are:

| | |
|---|---|
| Hydro | $15,000 |
| Transmission | 25,000 |
| Substations | 80,000 |
| Distribution | 220,000 |
| Miscellaneous | 25,000 |
| | $365,100 |

No improvements to generators are contemplated or in progress. Seven miles of new 110-kv. line and reinsulating of 9 miles from 50 to 110 kv. are in progress and will be completed this year. Five miles of 50-kv. line are being completed this month.

The following will be completed in the first half of 1940: 36,000 kva. 110/13.8-kv. transformer capacity at Tide Flats substation; 3,500 kva. 52.5/13.8-kv. on the Fort Lewis Army Reservation; several installations of from 2,000 to 4,000 kva. for industrial customers; two installations of about 3 mi. of sodium vapor highway lighting—one within the city, and one on the State highway.—*Verne Kent, superintendent.*

## Washington Water Power

Our construction budget for 1940 is $1,467,600 as compared with $1,341,535 in 1939.

**1939 Construction**

Generation: No capacity was added. An outdoor switching station was built at Little Falls station, using breakers from Long Lake station where a new breaker was installed. Some 25 mi. of transmission was rebuilt. New distribution systems were built to serve Conconully, Wellpinit, Loomis and Warden, Wash., and systems were rebuilt in Grangeville, and Post Falls, Idaho, and in Medical Lake, Omak, Reardan and Sprague, Wash. Many others were partially reconstructed. About 60 mi. of feeders were rebuilt and approximately 100 mi. added.

Substations were added at Ford, Wash., and at St. Maries and Hayden Lake, Idaho, and the capacities of several others increased. A 450-kva., underground vault was added in Spokane. Installation of 5,800 kva. of new transformers was involved.

**1940 Construction**

Generation: The Meyers Falls timber dam will be rebuilt, and at Long Lake stations four 115-kv. breakers will be replaced with new ones of 1,000,000-kva. interrupting capacity. Nine miles of 110-kv. transmission near Spokane will be added to connect East Side substation with Sunset switching station, which is to be constructed. Breakers salvaged from Long Lake will be installed. Spare transformers will be installed at Coulee, Northwest, Magnesite and Moscow substations. Rebuilt will be 11 mi. of 60- and 33-kv. line.

Substation capacity will be augmented with 2,667 kva. of transformers, to be installed as spares at Brewster, Colfax and Coeur d'Alene City subs. Capacities will be increased elsewhere.

Other new equipment, such as breakers, voltage regulators, ground relays and grounding banks, will be installed in various substations. A new underground vault will be constructed in Spokane.

Activities will reflect, in general, improvement in facilities and service, as the trend continues toward greater load building.—*J. E. E. Royer, vice-president and general manager.*

# Wyoming

## Kendrick Project, USBR

During 1939, installation of three 12,000-kva. generating units was completed; 325 mi. of 110-, 66-, and 33-kv. transmission lines were built to various load centers. Power from Seminoe plant will be made available at Rawlins, Laramie, Cheyenne, and Casper, Wyo.; Greeley, Wiggins, Fort Morgan, and Brush, Colo., and Gering, Neb.

## Riverton Project, USBR

Construction of a 50-mi. 33-kv. transmission line between Pilot Butte power plant and Thermopolis, Wyo., was completed and placed in operation during 1939.

IMPROVING. The word recurred in many of the reports of sales and commercial activities for 1939 which executives of utilities throughout the West sent to ELECTRICAL WEST for this annual check-up of electrical sales progress. In all others the report was "fair," or "good."

A study of the figures substantiated that same thought. As the figures were gathered together into the tables on these pages for quick appraisal and comparison, the verdict, "improving", was inevitable. In almost no instance was any recession noted. In general the improvement was in the nature of from 10 to 20%. And the general feeling about 1940 was similarly optimistic.

After following the trends of such reports for years, ELECTRICAL WEST notes a soberness and conservatism that used to be lacking in the frivolous '20's. The trying '30's have taught caution to sales executives of utilities, it seems. But nowhere in this year's reports is there a note of pessimism. A few years

## Up

back there were such comments. The electrical industry of the West, both private and municipal, is proceeding much more soundly perhaps because of this serious and conservative tendency. The figures these utilities have reported here are far more important as a consequence.

Of the 3,132,000 domestic and rural customers in the 11 Western states, reports were received from the major utilities representing over 2,770,000 of them. Based on the figures derived from those reporting, the percentages holding true, total sales in 1939 for the area can be projected with more than reasonable accuracy.

Electric ranges, for which the reports actually account for 54,633, probably sold to a total of 55,000 or more. Quotas set for 1940 would indicate on the same basis that 60,700 will be sold, a 10.4% increase in 1940.

## Go

Water heaters made one of the longest strides in the history of this appliance with total sales of 25,950, and quotas for 1940 indicate that 30,200 will be sold this year, an increase of 16.4%.

Refrigerators, the other major appliance upon which figures are reasonably complete, sold to the extent of 232,500 units, with prospects for a total of 254,500 for 1940, an increase of 9.5%.

Total dollar volume of appliance sales in the West, including all appliances, from these reports is estimated to have been $108,000,000, an $8,000,000 increase over 1938.

Several years ago the company whose average annual domestic consumption was over 1,000 kw-hr. was spectacular and pointed to with pride. In 1939 there were 19 utilities in these 11 western states and British Columbia whose

## Sales

average annual domestic consumption was over 1,000. In fact two were over 2,000 kw-hr., California-Oregon Power Co., with 2,250; Washington Water Power Co. with 2,060. Close to them were City of Tacoma with 1,900, Idaho Power Co. with 1,835, and Pacific Power & Light Co. with 1,606. There were only 16 utilities whose average topped 1,000 kw-hr. in 1938.

The greatest increase in kilowatt-hour consumption average was reported by Puget Sound Power & Light Co., with 135 kw.-hr.; next came Idaho Power with 117 kw.-hr.; and Seattle City Light with 106.

As many of the figures reported from the various utilities as possible have been consolidated into the tables on these pages and will prove interesting and profitable to study. Explanatory notes which give interpretations of some of the figures or collateral information which illustrates the sales background against which these figures were made will be found in the following brief additional comments from the utilities.

# Arizona

## Central Arizona Light & Power Co.

Serving chiefly an agricultural territory, the Central Arizona Light & Power Co. also sells natural gas in the Phoenix area. Its major competing fuel is bottled gas. Especially active on lighting promotion in 1939, the figures reported in the tables should be supplemented by 3,000 other portable lamps sold by dealers in the territory. Estimates of replacement sales were made from dealer reports. The company issued a monthly dealer bulletin and maintained general sales promotion for dealers.

In respect to fluorescent lighting, careful watch of each installation is made and a requirement of 90% power factor insisted upon. The company maintained 12 domestic salesmen and seven combination men. The home service girls do a limited amount of selling and help to promote lighting sales.—*A. F. Morairty, Assistant General Manager.*

## Tucson Gas, Elec. Lt. & Power Co.

While we have few industrial customers, we do have a number of irrigation customers, a total of 136 whose average annual consumption is 30,413 kw-hr. in 1939. The company territory is urban and suburban in character with business conditions generally good. Natural gas is the competing fuel and the company sells it also.

This company does not merchandise appliances and dealer sales are estimated at $300,000 in volume. Estimates are also made as to dealers figures on ranges, water heaters and refrigerators.

We have one combination salesman in the commercial and industrial field. Our policy on fluorescent lighting is passive. Outstanding new installations in 1939 were a Federal building air conditioning job of 250 kw. and a Woolworth store containing 45 kw. of light and 55 kw. of power.—*W. H. Howe, Sales Manager.*

# California

## Alameda PU Dept.

Major change in the operations of the city of Alameda Lighting Department in 1939 was a withdrawal from direct merchandising of appliances. After active merchandising during the past three or four years, the Department decided to put all of its efforts into the stimulation of sales to dealers. Displays of dealer merchandise are maintained in the commercial office of the utility and the Modern Kitchen Bureau's advertising campaign material is employed in display and in dealer advertising. The Department subsidizes dealer advertising up to $40 monthly as a direct assistance towards building volume. The Sales Manager also assists in various dealer problems.

Industrial kilowatt-hour consumption is high because of the dredging at the U. S. Naval Base which alone will have used 10,872,000 kw.-hr. in 1939. This utility has established no policy respecting fluorescent lighting as yet. The major fuel competing with electricity is natural gas which is not handled by this bureau.—*H. A. Lewicki, Sales Manager.*

## Burbank Public Service Dept.

Of the 395 electric ranges installed in Burbank in 1939, 263 were new installations, 132 were used ranges moved in from other districts; 75 water heaters were added in the year. This now brings the total of ranges to over 900. No existing figures are available on other appliances. Increased industrial activity and a building boom have resulted in a phenomenal growth during the year 1939 and from all indications a continuance in 1940 should see 500 ranges added. Other than cooking schools and dealer cooperation as in the past, we contemplate no additional activity.

The two industrial consumers who used 75 per cent of our output account for the high average industrial kw.-hr. consumption for industrial customers. Burbank is industrial territory and the major competing fuel is gas.—*C. F. Kirk, New Business Manager.*

## Coast Counties Gas & Elec. Co.

Our merchandise volume will approximate $25,000 and the figures reported in the tables represent sales made by the company only. The number of appliances sold by dealers throughout our territory is unknown. We have a total of 25,784 electric meters with a grand total estimated annual kw.-hr. consumption per customer of 2,568. The domestic meters numbering 19,978 bring an estimated annual domestic consumption of 791. We have 1,411 agricultural power meters with an estimated annual agricultural power consumption per customer of 12,935.

Our methods of keeping statistics have been simplified to the extreme for economy and other figures are not available.—*H. W. Edmund, Sales Manager.*

## Glendale Public Service Dept.

Figures for the city of Glendale are those for ranges and water heaters only. Other statistics regarding appliance sales are not available. Saturation figures are based upon the records of our range and water heater installations with an estimate for refrigerator saturation.

The public utilities department maintains a cooking school and holds a dealer appliance show and participates in dealer organizations for promotion of appliance sales through its new business department. No attempt is made to handle the trade-in problem. Territory served is urban and the competing fuel is natural gas served by another utility.

The department maintains three domestic salesmen but no other sales staff except a home service girl. On fluorescent lighting, the policy is to require power factor correction.—*P. Diederich, Superintendent.*

## Los Angeles Bureau of P. & L.

The Bureau in Sept. 1939, started a new dealer cooperative "survey unit" in which the dealer salesmen, trained in the Bureau's cooking and sales schools, are hired by the dealers on a cooperative basis. The dealer salesmen are given a three-day sales school and are kept informed by means of the "Range Masters Club" and through the promotional effects of the Electrical Development League of Southern California. Promotions during the year included showings at the Spring Home Show and the Fall Food Show and at local dealer expositions. The Matchless Electric Home has been a veritable sales center for home electrification.

Replacement and saturation figures are estimated from the confidential dealer reports and by the utility's own records as to ranges and water heater connections to the line.

Home lighting is handled by the illuminating section. Because of the great number of new homes being constructed in and around Los Angeles, we find an increased interest in adequate wiring and home illumination. We have experienced cooperation from the fixture manufacturers in selling equipment that is pleasing in appearance, but at the same time produces good illumination.

In the apartment house field, we have conducted an intensive campaign for the past ten months to indicate to apartment house managers or others how rentals can be held up and tenants attracted by means of adequate lighting from portable I.E.S. lamps. As the result of this promotion, dealers through our recommendations have sold approximately 1,500 lamps. In 1940 we intend to carry these programs out as at present.

The Bureau has 30 dealer contact representatives, 20 new building contact representatives and through the new dealer setup, 150 dealer salesmen. In the lighting department there are eight on full time and 28 part time. There

## CUSTOMERS AND CONSUMPTION

| COMPANY | Residential customers | | | Average annual kw.-hr. consumption—Residential | | | | | Commercial customers | | Industrial customers | | Load increases kw. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1938 | 1939 | % rural | 1939 | 1938 | 1937 | 1936 | 1935 | No. 1939 | Ave. ann. consump. | No. 1939 | Ave. ann. consump. | Agric. | New load | Indust. | Oil | Mining |
| Alameda, City of | 10,421 | 10,703 | | 1,023 | 971 | 968 | 857 | 798 | 991 | 3,210 | 387 | 38,369 | | | | | |
| B. C. Elect. Rw. Co., Vancouver | 88,000 | 90,000 | 9 | 1,025 | 1,003 | 991 | 977 | 975 | 15,300 | 4,060 | 2,575 | 63,600 | | | 8,000 | | |
| B. C. Elect. Rw. Co., Victoria | 18,507 | 19,000 | 16 | 806 | 760 | | | | 3,360 | | 446 | | | | 800 | | |
| Burbank, City of | 7,639 | 10,028 | | 850 | 828 | 853 | | 601 | 1,243 | 3,850 | 10 | 1,367,374 | | | | | |
| Calif-Oregon P. Co. | 25,987 | 28,300 | 11 | 2,250 | 2,167 | 2,100 | | 1,729 | 6,690 | 4,220 | 104 | 557,000 | | 253 | 700 | | 750 |
| Central Arizona L. & P. | 24,390 | 25,461 | 3 | 1,038 | 975 | 910 | 821 | 731 | 3,715 | 9,923 | 254 | | | | | | |
| Coast Counties G. & E. Co. | | 19,978 | 6 | 791 | 796 | 820 | | | 4,357 | 6,900 | | | | | | | |
| Eastern Oregon L. & P. | 6,157 | 6,320 | | 910 | 850 | | | | 1,210 | 13,175 | | | 10 | | 15 | | 150 |
| El Paso Electric | 20,442 | 21,139 | 8 | 1,120 | 1,058 | 952 | | | 3,385 | 6,920 | 130 | 392,000 | | | | | |
| Glendale, City of | 23,187 | 24,300 | | 1,010 | 971 | | | | 3,385 | 4,800 | | | | | | | |
| Grays Harbor R. & L. Co. | 9,616 | 9,600 | 3 | 650 | 613 | | | | 1,800 | | 35 | | | | 500 | | |
| Idaho Power | 50,025 | 52,683 | 27 | 1,835 | 1,719 | 1,577 | 1,358 | 1,276 | 6,409 | 6,244 | 658 | 69,752 | | | 550 | | |
| Los Angeles B. P. & L. | 352,273 | 396,000 | | 900 | 838 | 782 | 692 | 724 | 89,000 | 7,150 | 3,700 | 87,000 | | 46,000 | | | |
| Montana Power Co. | 67,745 | 69,000 | 4.2 | 870 | 839 | 815 | 781 | 724 | 11,000 | 5,050 | 1,200 | 760,000 | | | | | |
| Mountain States P. Co. | 46,376 | 49,200 | 15 | 1,280 | 1,247 | 1,156 | 972 | 792 | 8,600 | 2,600 | 2,700 | 32,500 | | | | | |
| Nevada-Calif. Elect. | 27,044 | 25,500 | 5.7 | 1,400 | 1,370 | 1,291 | | | 4,500 | 30,869 | | | 721.2 | 500 | 510 | | 842 |
| Northwestern Elect. | 26,238 | 31,520 | 14 | 1,421 | 1,354 | 1,308 | 1,240 | 1,202 | 5,700 | 9,771 | 570 | 364,735 | | | 3,665 | | |
| Pacific G. & E. Co. | 658,685 | 684,236 | 30 | 985 | 945 | 849 | 791 | 731 | 125,000 | 4,042 | 33,000 | 45,876 | | | | | |
| Pacific Power & Light Co. | 54,081 | 56,700 | 20 | 1,606 | 1,550 | 1,475 | 1,382 | 1,279 | 8,300 | 5,725 | 560 | 105,000 | | | 3,250 | | |
| Pasadena, City of | 27,179 | 27,554 | | 986 | 929 | 887 | | | 3,478 | 7,037 | 35 | 460,083 | | | | | |
| Portland Gen. Elect. Co. | 115,936 | 120,500 | 31 | 1,380 | 1,317 | 1,237 | 1,160 | 1,046 | 14,825 | 7,000 | 185 | 1,230,000 | | 240,000 | 5,200 | | |
| Public Service of Colorado | 106,224 | 112,270 | 4.1 | 700 | 653 | 620 | 579 | 534 | 17,709 | 4,072 | 6,428 | 31,340 | | 300 | 5,000 | | 3,600 |
| Puget Sound P. & L. Co. | 166,869 | 172,450 | 49 | 1,391 | 1,295 | 1,236 | 1,141 | 1,002 | 22,900 | 9,900 | 650 | 500,000 | | | | | |
| San Diego C. G. & E. | 73,126 | 77,346 | 21 | 954 | 896 | 835 | 733 | 630 | 12,999 | 4,660 | 4,929 | 12,920 | | | | | |
| San Joaquin Pr. P. G. and E. | 90,365 | 96,500 | 55 | 1,270 | 1,254 | 1,187 | 1,100 | 1,020 | 23,309 | 21,217 | 1,271 | 471 | 14,373 | 8,462 | 6,933 | 4,984 | 467 |
| Seattle, City of | 80,787 | 81,000 | 4 | 1,490 | 1,384 | 1,268 | 1,125 | 1,075 | 9,400 | 8,698 | 3,300 | 35,388 | | | | | |
| Sierra Pacific Pr. Co. | 11,131 | 11,800 | 13.5 | 1,466 | 1,440 | 1,354 | 1,181 | 1,005 | 2,200 | 10,000 | 125 | 250,000 | | | | | |
| Southern Calif. Edison | 448,528 | 433,800 | 6.2 | 977 | 945 | 910 | 801 | 737 | 56,250 | 3,300 | 23,550 | 46,400 | 2,300 | 10,600 | 30,800 | 11,450 | |
| Southern Colo. Pr. | 21,239 | 21,657 | 7.7 | 883 | 838 | 741 | 682 | 623 | 3,915 | 2,491 | 1,620 | 18,977 | 87 | 20 | | | |
| Tacoma, City of | 31,420 | 32,325 | 7.7 | 1,900 | 1,804 | 1,632 | 1,614 | 1,563 | 3,871 | 9,500 | 984 | 210,000 | | 2,000 | | | |
| Tucson G. E. L. & P. | 12,892 | 14,116 | 37 | 932 | 911 | 876 | | | 1,800 | 9,910 | 9 | 266,803 | | | | | |
| Utah Power & Lt. | 100,879 | 104,346 | 16.5 | 1,140 | 1,068 | 1,067 | 876 | 766 | 10,460 | 6,277 | 1,923 | | 1,298 | | 9,040 | | 4,070 |
| Washington Water Pr. | 66,375 | 68,631 | 8.5 | 2,060 | 1,985 | 1,879 | 1,775 | 1,665 | 9,641 | 8,750 | 607 | 714,223 | | | 8,100 | | 2,700 |

are 25 on residential, commercial heating and industrial heating, and three specializing on industrial heating, air conditioning and private plants.

Respecting power factor, we have a rule which prohibits the use of fluorescent lighting when power factor is under 90 per cent. Fluorescent lighting is not actively promoted for general application. We find, however, there are applications for which, because of its color and decorative effect, it has a desirable use. At the present time, we do not recommend it for general lighting which would ordinarily be served by incandescent lamps.

New power load is not segregated according to classifications. Total loads added inclusive of commercial power were 46,000 kw.

Only minor modifications were made in the rates during the year to permit larger motor units for air conditioning on domestic rates. Business conditions were above normal. The major competing fuel is natural gas sold by competing utilities. Three reverse cycle air conditioning installations were reported during 1939.—*Burdette Moody, Business Agent.*

## Nevada-California Electric Corp.

Appointment of four more customer representatives now brings to Imperial Valley fourteen such men to represent the Nevada-California Electric Corp. Each man has a territory of from 400 to 700 meters. His duties consist of seeing his customers twice a month at their own homes, reading the meter, delivering the bills, and offering personal service and advice to the customers regarding their appliances. Virtually, he has a small business of his own for which he is responsible.

Besides the company has two full time lighting engineers, one for Imperial Valley and the other for its San Bernardino and Riverside area. Increase of 700 kw. in commercial and industrial lighting load was made last year. Fluorescent lighting is recommended for special effect lighting only. Power factor of 90 per cent is required on all installations over 200 volt-amp. There are eight power salesmen and ten combination salesmen in the crew.

Competing fuel is natural gas sold by other utilities. No figures are kept on dealer sales.—*George T. Bigelow, General Commercial Manager.*

## Pacific Gas and Electric Co.

Major appliance sales volume is considered generally satisfactory in this area and represents with few exceptions increases over 1938. We believe that 1940 results will be comfortably ahead of this year's record.

Butane and propane gas equipment have made some headway into the range and water heater market in rural areas this year through the use of portable tanks and high dealer premiums. As a result of this, a number of former exclusive electric range dealers are now beginning to favor this competitive fuel equipment. It presents a problem which affects both the utility and the electric range and water heater manufacturer and one that must be solved cooperatively.

No major change in sales policy or merchandising activity is contemplated by our company next year. The broad dealer cooperative program that has been in effect here for a number of years has brought about not only an aggressive merchandising situation within the industry but also an enviable relationship between the different branches of it. We have increasing confidence in this program and any change we make will mean strengthening and expansion of it.

The air heater figures in the tables represent both auxiliary air heaters and major air heaters. There were 5,966 auxiliary air heaters sold in 1939 and 1,478 major air heaters of 2 kw. or over. In 1938 the auxilliary heater sales were 7,727 and major air heaters 1,034.

The saturation figures for our company really should be broken into sales for gas and electric territories, straight electric territory and totals. The figures in the table are from the total or average of the two types of territories. These figures are derived by rather accurate surveys of customers.

Promotional activities are handled through the Electric Appliance Society

Small Users First to Benefit!
HERE ARE THE OLD AND NEW RATES!
Learn How to Use the NEW LOW RATES!
Use Electricity
~PGE~ Portland General Electric Co.
Danger! Eyes at Work!
Light Condition with Cheap Electricity
100-WATT BULBS CAN BE
BURNED 3 HOURS FOR 1¢
MAZDA LAMPS
SIX 100 WATT MAZDA BULBS
Genuine Railley PIN-IT-UP Lamp
all for only... $2.45
regular price $4.85
SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
BETTER LIGHT FOR FUTURE PRESIDENTS
PACIFIC GAS AND ELECTRIC COMPANY
Cheap ELECTRICITY AIDS UTAH INDUSTRY
UTAH POWER & LIGHT CO.

HERE'S only a few of the many sound and sales-building newspaper advertisements run recently by western utilities. Ranging from lower rate announcements to a light bulb campaign, these advertising messages not only increased sales through 1939, but built good will for the electrical industry as well. Utilities represented in these advertisements are Portland General Electric Co., San Diego Consolidated Gas & Electric, Utah Power & Light, Washington Water Power and Pacific Gas and Electric Co.

and the trade-in problem by the Appliance Dealers Trade Association. In our territory, sales training for dealers is done by six appliance counselors and 18 dealer salesmen developing promotional and selling ideas. Through the Appliance Society, selling classes were held under the George Dean Act as already reported in Electrical West.

We have 180 domestic salesmen, 24 lighting salesmen, 45 combination men. Domestic lighting shows an increase of 33 per cent in 1939 over 1938 and it is estimated there will be the same increase in 1940. Commercial lighting showed a 10 per cent increase in 1939. We will increase our man power in 1940.

Our policy on fluorescent lighting is to require power factor correction.

Territory served is varied. It includes urban, agricultural and industrial. Business conditions were generally good and competing fuel is oil and butane. The company sells manufactured and natural gas. During the year a reduction in the service charge for the first block of domestic rates was made.

The company mantained an extensive exhibit at the Golden Gate International Exposition upholding the electric utilities' end of exhibits at that Fair. In general, we look for a 10% increase in business in 1940.—*O. R. Doerr, General Sales Manager.*

## City of Pasadena

An open-house at our power house each year at which the dealers of Pasadena exhibit appliances is the main promotional event which we conduct. This is usually held close to the Christmas season and aids in stimulating the electrical idea at that season.

The department has one man who makes contacts but does not engage in any direct sales.

Saturation figures are based on actual surveys. The appliance figures are available only on ranges, water heaters and refrigerators.

As to fluorescent lighting, we allow it to be used in Pasadena without power factor correction. Business conditions were fair in 1939. Major competing fuel is gas sold by competing utilities.—*B. F. DeLanty, General Manager, Municipal Light & Power Dept.*

## San Diego Consolidated Gas & Electric Co.

Since the dealer activities in San Diego are well covered in the report of the Bureau of Radio and Electrical Appliances of San Diego County, only a few comments interpretative of the figures in the tables will be made here. Figures represent the sales report turned into the Bureau consolidated with company sales figures. The total dollar volume is an estimate based on the average of appliance sales.

As for the company itself, it has 29 domestic salesmen, three lighting salesmen, and its headquarters specialists. During 1939, we exceeded our 2,500 kw. bogey in commercial lighting sales and all other lighting was up over 1938. Our policy on fluorescent lighting is not promotional and we insist on power factor correction. We have a lamp crew of eight men and a supervisor on domestic lighting sales.

During the year reductions were made in January and November. On our domestic D-1 schedule, for example, first 12 kw. is 90c (no change). Next 38 reduced from 3.8c to 3.3c; next 150 from 2.5c to 2.3; excess remains at 1.5c.

Territory served is 85% urban, 5% agricultural. Business conditions were good. The company sells natural gas. —*A. E. Holloway, Vice-president in Charge of Sales.*

## San Joaquin Power Division, PG&E

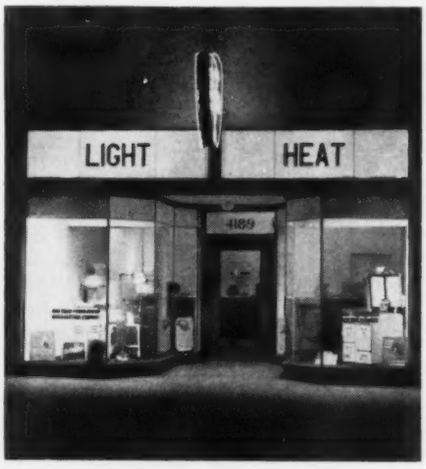
Probably the most obvious change during the year was that of name of the company. Otherwise merchandising policies and program have continued along the same "through the dealer" plan developed many years ago and constantly being strengthened. For technical and legal reasons, the company became known as the San Joaquin Power Division of Pacific Gas and Electric Co., but its operations are still separately managed and policies remain the same.

The "through the dealer" plan is still operated by Valley Electrical Supply Co., merchandising subsidiary. During the year constant contact was maintained with dealers through personal salesmen working with them and through meetings and classes. Outstanding new promotional developments of the year were our portable kitchen which has been taken to all of the district fairs and will be in use again this year. The kitchen planning service and wiring layout service have been shifted to the Valley Electrical Supply Co. and are expected to develop further through dealer cooperation.

There were domestic rate decreases of approximately 2½% during the last year. Figures on replacements and saturation are based on experience and dealer reports which are maintained monthly. There are 29 domestic salesmen, working through dealers in the domestic field. In the commercial field we have five lighting salesmen. Quotas were exceeded in all branches of commercial lighting during the year. Policy on fluorescent lighting is to promote it for decorative effect where we believe it is applicable.

Competing fuel is natural gas and bottled gas. The company sells natural gas in some areas. Territory is generally agricultural.—*G. E. Zelhart, Sales Engineer.*

HOW TO MAKE the ordinarily dark window space above show windows into an attractive sign is demonstrated at one of the district offices of San Diego Consolidated Gas & Electric Co. Letters are fired on flashed opal glass. When lighted from behind, this space is converted into a luminous front sign, easily read and seen



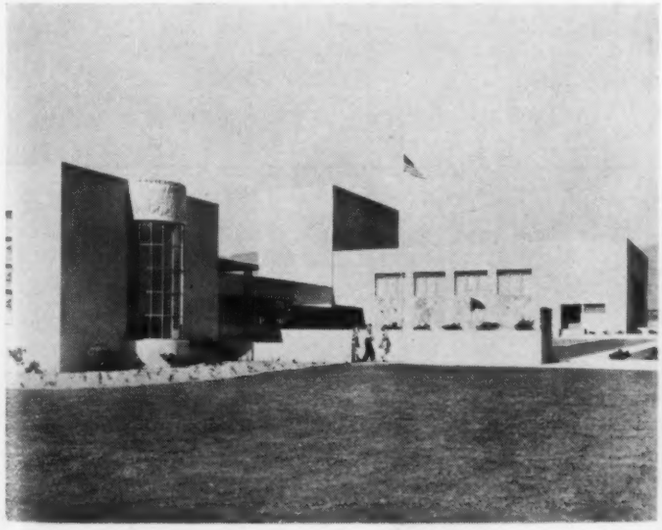

## Southern California Edison Co.

A decided improvement in public acceptance of lighting has been noted during 1939. We will continue our active program in this respect in 1940. As to fluorescent lighting, we are not promoting it but have no objection if the lights are corrected for power factor. Sales personnel consists of 150 domestic salesmen, 20 commercial lighting, ten commercial salesmen, four industrial lighting, 28 industrial salesmen and two combination men. There has been considerable increase in industrial power usage due to manufacture of war materials, particularly airplanes. The company's territory is urban, agricultural, industrial and major industries. General business conditions were improving. Natural gas is the competing fuel sold by other utilities.

Promotional events during the year were active participation in the Los Angeles County Fair with a large domestic display and separate and equally large agricultural power display. We also had an extensive display in the San Bernardino Orange Show. Our dealer work is closely coordinated with the Electrical Development League of Southern California and we expect to continue cooperation and campaign leadership in the territory outside of the city of Los Angeles.

Our consumption figures are influenced by a transfer of a portion of our property to the city of Los Angeles during 1939. Territory annexed by the city formerly served by us was turned over to the city at that time. These influence our annual consumption figures. —*R. C. McFadden, Sales Manager.*

SCHOOL LIGHTING in Southern California Edison territory has been extensively improved during the past year. At the present time, when new schools are built, lighting is really provided. This new elementary school at Upland, Calif., is an excellent example. A typical room, as shown, has six units, 500-watt on the inner row, and 300-watt on the outer row, producing a minimum of 18 ft.-candles on inside desks. The eyesight of growing children is thus protected and efficiency of their school-work improved tremendously. How different this is from early American school houses, or even from poorly equipped buildings today



# UTILITY AND DEALER APPLIANCE SALES

| COMPANY TERRITORY | Total $ vol. co.-dlr. sales (000) | RANGES | | | | | WATER HEATERS | | | | | REFRIGERATORS | | | | | WASHERS | | | | | IRONERS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 |
| Alameda, City of | | 263† | 172† | | | | 35† | 24† | | | | 197† | 199† | | | | 151† | 131† | | | | 58† | 46† | | | |
| B. C. Elect. Rw. Co., Vancouver | 1,800 | 799 | 934 | 935 | 25 | 14 | 116 | 102 | 110 | 10 | 3 | 1,926 | 1,892 | 2,010 | 4 | 12.5 | 2,924 | 2,883 | 3,050 | 60 | 45 | 273 | 118 | 120 | | 2.7 |
| B. C. Elect. Rw. Co., Victoria | 266 | 149 | 140 | 162 | | | 33 | 23 | 18 | | | 348 | 405 | 425 | | | 502 | 510 | 550 | | | 22 | 11 | 13 | | |
| Burbank, City of | | 273† | 395† | 500† | 10† | 10† | 75† | 75† | 200† | | 4† | | | | | | | | | | | | | | | |
| Calif-Oregon P. Co. | | 1,595 | 1,571 | | 6.6 | 43 | 1,056 | 1,240 | | 3 | 21 | | | | | | | | | | | | | | | |
| Central Arizona L. & P. | 825 | 262 | 181 | | 10 | | 65 | 63 | | | | 2,407 | 2,210 | | 40 | | 2,109 | 1,903 | | 80 | | 173 | 147 | | 5 | |
| Coast Counties G. & E. Co. | 25 | | 50* | | | | | 100* | | | | | 50* | | | | | | | | | | | | | |
| Eastern Oregon L. & P. | 175 | 202 | 193 | 250 | 15 | 30 | 90 | 81 | 200 | | 8 | 528 | 483 | 500 | 25 | 62 | 512 | 479 | 520 | 40 | 83 | 78 | 42 | 65 | | 8 |
| El Paso Electric | 661 | 400 | 306 | 350 | 2 | 18.1 | 358 | 264 | 300 | .05 | 11.7 | 1,719 | 1,412 | 2,035 | 7.5 | 63.5 | 162 | 260 | 400 | 5 | 20 | 56 | 46 | 150 | 1 | 1 |
| Glendale, City of | 48‡ | 459 | 306 | | | 11 | 56 | 41 | | | 1.3 | | | | | 35 | | | | | | | | | | |
| Grays Harbor R. & L. Co. | 250† | | | | | | | | | | | | | | | | | | | | | | | | | |
| Idaho Power | 2,974 | 4,475 | 3,550 | 3,540 | 27 | 55 | 2,103 | 1,683 | 1,700 | 10 | 25 | 4,105 | 4,841 | 4,840 | 13 | 55 | 3,641 | 4,741 | 4,700 | 25 | 70 | 400 | 353 | 400 | 5 | 10 |
| Los Angeles B. P. & L. | 19,500† | 5,420† | 6,500† | 7,500† | 3† | 5.4† | 1,583† | 2,500† | 4,000† | | 1.8† | 30,300† | 50,000† | 65,000† | 50† | 55† | 20,000† | 28,000† | 30,000† | 70† | 70† | 40,00† | 5,000† | 5,500† | 5† | 5† |
| Montana Power Co. | 238* | 450* | 1,282 | 1,863 | 20 | 20 | 91* | 171 | 343 | | | 585* | 5,992 | 7,012 | 5 | 5.0 | 81* | 6,009 | 7,425 | | | | | 50 | | |
| Mountain States P. Co. | | 1,033† | 1,407† | | 22.5† | | 398† | 496† | | | | 2,153 | 3,593 | | 9.2 | | | 2,639 | | | | | 236 | | | |
| Nevada-Calif. Elect. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Northwestern Elect. | 2,122† | 1,605† | 1,663† | 2,100† | 25† | 41.1† | 417† | 469† | 815† | 5† | 7.4† | 3,278† | 3,439† | 3,220† | 15† | 54.8† | 3,022† | 3,368† | 3,350† | 30† | 69.6† | | | | | 9.7† |
| Pacific G. & E. Co. | 2,500 | 4,053 | 3,897 | 4,675 | | 9 | 2,635 | 2,971 | 3,220 | | 5 | 40,141 | 46,406 | 51,045 | 20 | 40 | 29,634 | 34,087 | 39,200 | 35 | 57 | 5,938 | 6,354 | 6,480 | | 8 |
| Pacific Power & Light Co. | 2,934 | 1,693 | 1,961 | 2,122 | 20 | 17.7 | 1,051 | 1,281 | 1,311 | 4 | 11.2 | 5,312 | 6,053 | 6,580 | 15 | 36 | 5,207 | 5,701 | 6,296 | 38 | 78.3 | 456 | 478 | 510 | 10 | 6.2 |
| Pasadena, City of | | 161† | 205† | 300† | | 4.5† | 109† | 106† | 150† | | 2.1† | 1,893† | 1,800† | 1,500† | | 62† | | | | | 52.4† | | | | | 6.8† |
| Portland Gen. Elect. Co. | 2,500† | 4,140† | 4,450† | 5,050† | 16† | 26† | 1,322† | 1,950† | 2,600† | 3† | 8† | 6,285† | 5,300† | 5,500† | 5† | 51† | 6,330† | 5,000† | 4,800† | | 60† | 1,008† | 700† | 800† | | 19† |
| Public Service of Colorado | 1,005 | 398* | 591 | | 5* | 5.5* | 30* | 109 | | | | 1,362* | 1,724 | | 10* | 51* | 586* | 716 | | 25* | 60* | 110* | 171 | | | 7* |
| Puget Sound P. & L. Co. | 3,423 | 4,543 | 5,509 | 5,600 | 36.4 | 28 | 1,972 | 2,929 | 3,400 | 8.7 | 12 | 8,691 | 10,716 | 10,880 | 5.9 | 36 | | | | | | | | | | |
| San Diego C. G. & E. | 3,500 | 600 | 530 | 600 | | | 575 | 475 | 600 | | | 7,675 | 8,100 | 8,000 | | | 4,185 | 4,300 | 4,300 | | | 700 | 710 | 800 | | |
| San Joaquin Pr. P. G. and E. | 3,004† | 1,447† | 1,379† | 1,550† | 18† | 15† | 757† | 732† | 850† | 6† | 8† | 6,852† | 6,897† | 7,000† | 8† | 72† | 4,251† | 4,901† | 4,700† | 45† | 60† | 671† | 682† | 1,200† | 0† | 5† |
| Seattle, City of | 496* | 2,158* | 3,561 | 4,500 | 27 | 46 | 1,369* | 1,614* | 2,000* | | 28* | | | | | | | | | | | | | | | |
| Sierra Pacific Pr. Co. | 750† | 713† | 894† | 1,000† | 14.9† | 55.6† | 232† | 280† | 300† | 5.1† | 16.1† | 971† | 1,101† | 1,200† | 34.9† | 67.4† | | | | | | | | | | |
| Southern Calif. Edison | 14,000 | 5,120 | 4,723 | 5,000 | 17 | 9.5 | 1,530 | 1,444 | 1,600 | 11 | 4 | 33,052 | 35,893 | 35,000 | 10 | 60 | 25,376 | 27,093 | 25,000 | 33 | 55 | 3,534 | 3,377 | 3,500 | | 4 |
| Southern Colorado Pr. | 190* | 380 | 460 | 540 | 10 | 21 | 173 | 161 | 200 | 1 | 5 | 1,709 | 2,012 | 2,100 | 15 | 40 | 1,801 | 2,132 | 2,225 | 25 | 65 | 147 | 217 | 250 | | 5 |
| Tacoma, City of | | 1,000 | 1,500 | 1,750 | 40 | 39 | 375 | 600 | | 27 | 35 | | | | | | | | | | | | | | | |
| Tucson G. E. L. & P. | 300† | 150† | 150† | 150† | 10† | 10† | 50† | 50† | 50† | 10† | 3† | 1,400† | 1,500† | 1,500† | 15† | 70† | | | | | | | | | | |
| Utah Power & Lt. | 6,162 | 2,942 | 3,493 | 3,850 | 30 | 38 | 815 | 990 | 1,060 | 5 | 6 | 7,472 | 9,444 | 10,100 | 25 | 60 | 8,668 | 8,953 | 9,990 | 75 | 80 | 607 | 616 | 665 | 75 | 1.5 |
| Washington Water Power | 3,754 | 2,256 | 2,601 | 3,600 | 45 | 35 | 1,591 | 2,432 | 3,000 | 20 | 25 | 6,508 | 7,473 | 7,830 | 30 | 30 | 5,087 | 5,674 | 6,550 | 70 | | 374 | 370 | 460 | 50 | |

| COMPANY TERRITORY | CLEANERS | | | | | RADIOS | | | | | AIR HEATERS | | | | | IES LAMPS | | | | | AIR CONDITIONING | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | 1938 co.-dlr. sales | 1939 co.-dlr. sales | 1940 co.-dlr. quota | % repl. 1939 | % sat. 1939 | With refrig. | Evap. coolers | Attic fans | Others |
| Alameda, City of | 102† | 81† | | | | 550† | 439† | | | | 159† | 85† | | | | | | | | | | | | |
| B. C. Elect. Rw. Co., Vancouver | 1,325 | 1,305 | | 55 | 68 | 10,281 | 10,913 | 9,500 | 80 | 82 | 382† | 375† | 500† | | | 7,500 | 7,500 | 7,500 | | | | | | |
| B. C. Elect. Rw. Co., Victoria | 242 | 92 | | | | 1,565 | 2,100 | 1,875 | | | 134 | 109 | 183 | | | | | | | | | | | |
| Burbank, City of | | | | | | | | | | | | | | | | | | | | | | 100 | 25 | |
| Calif-Oregon P. Co. | | | | | | | | | | | | | | | | | | | | | | | | |
| Central Arizona L. & P. | 3,174 | 2,003 | | 80 | | 6,747 | 5,307 | | 70 | | 500 | 360 | | 5 | | 4,872 | 5,100 | | 10 | | 42 | 1,800 | | |
| Coast Counties G. & E. Co. | | | | | | | | | | | | | | | | | | | | | | | | |
| Eastern Oregon L. & P. | 117 | 184 | | 50 | 80 | 885 | 807 | 850 | 60 | 88 | 32 | 60 | 80 | | 10 | 469 | 500 | 600 | | 50 | 1 | 6 | | | 1 |
| El Paso Electric | 266 | 270 | | 3 | 60 | 1,400 | 1,200 | 2,000 | 20 | 96 | 100 | 100 | 160 | 5 | 20 | 3,039 | 3,800 | 4,500 | 5 | 40 | 1 | 1,820 | | | 1 |
| Glendale, City of | | | | | | | | | | | | | | | | | | | | | 4 | | | | |
| Grays Harbor R. & L. Co. | | | | | | | | | | | | | | | | | | | | | | | | |
| Idaho Power | 918 | 1,533 | | 10 | 80 | 7,823 | 9,565 | 8,960 | 50 | 95 | 609 | 783 | 610 | 75 | 35 | 5,429 | 7,323 | 5,800 | 2 | 30 | | | | | 469** |
| Los Angeles B. P. & L. | 5,900† | 8,000† | | 75† | 76† | 33,500† | 75,000† | 75,000† | 80† | 85† | 1,800† | 2,000† | 5,000† | 5† | 5† | | 1,500† | | | | 85† | 10† | 2† | | 3† |
| Montana Power Co. | 223* | 2,390 | | | | | 17,292 | 17,811 | | | | | 100 | | | 1,785* | 15,288 | 14,187 | | | 60 | 237 | 15 | | |
| Mountain States P. Co. | | 793† | | | | | 4,848† | | | | | | | | | | 3,400† | | | | | 160† | | | |
| Nevada-Calif. Elect. | | | | | | | | | | | | | | | | | | | | | | | | |
| Northwestern Elect. | 1,510† | 1,792† | | 50† | 67.2† | 8,266† | 7,864† | 7,750† | 50† | 107.2† | | | | | 9.4† | 7,077† | 8,875† | 9,425† | 20† | 35.3† | | | | |
| Pacific G. & E. Co. | 25,419 | 33,534 | | 55 | 56 | 124,749 | 141,500 | 148,575 | 90 | 99 | 8,761 | 7,444 | 8,190 | | 2 | | | | | | | | | |
| Pacific Power & Light Co. | 1,757 | 1,758 | | 29 | 75 | 10,740 | 13,624 | 13,500 | 63 | 91.8 | 528 | 415 | 470 | 11 | | 7,526 | 15,513 | 9,000 | 2 | 10 | | 10 | 44 | | |
| Pasadena, City of | | | | | 47.8† | | | | | 80† | | | | | | | | | | | | | | |
| Portland Gen. Elect. Co. | 2,671† | 2,500† | | 65† | | | | | | 98† | 1,360† | 1,500† | 1,500† | | 62† | 22,816† | 17,500† | 17,500† | | 48† | 20† | | | 25† |
| Public Service of Colorado | 1,153* | 1,343 | | 80* | 66* | 894* | 873 | | 80† | 80* | 144* | 194* | | | 15* | 7,020* | 8,136 | | | 35* | 1* | 43* | | 85* |
| Puget Sound P. & L. Co. | | | | | | | | | | | | | | | | 23,000 | 24,787 | 24,000 | | | 9 | | | |
| San Diego C. G. & E. | 2,900 | 3,000 | | | | 12,525 | 15,000 | 15,000 | | | 2,000 | 1,850 | 2,200 | | | 4,196* | 5,702* | 12,000 | | | | | | |
| San Joaquin Pr. P. G. and E. | 1,381† | 1,355† | | 65† | 60† | 8,309† | 10,161† | 9,000† | 70† | 94† | 1,002† | 1,177† | 1,110† | 20† | 20† | 4,374† | 3,510† | 6,500† | | 25† | 83† | 2,692† | 100† | | 18† |
| Seattle, City of | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sierra Pacific Pr. Co. | | | | | | | | | | | 80† | 42† | 65† | | | | | | | | 14† | 15† | 10† | | 5† |
| Southern Calif. Edison | | | | | | 53,384 | 58,279 | 55,000 | 50 | 90 | | | | | | 17,650 | 14,783 | 15,000 | | | 110 | 1,700 | 40 | | 20 |
| Southern Colorado Pr. | 538 | 562 | | 15 | 65 | | | | | 100 | 96 | 106 | 125 | 20 | 50 | 1,578 | 2,112 | 2,500 | | 25 | 10 | 62 | 2 | | 1 |
| Tacoma, City of | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tucson G. E. L. & P. | | | | | | | | | | | | | | | | | | | | | 10† | 750† | | | 1† |
| Utah Power & Lt. | | | | | | | | 31,000 | 75 | 100 | 1,044 | 912 | 739 | 75 | 7 | 15,898 | 16,185 | 18,780 | 30 | 51 | 51 | 771 | 550 | | 35 |
| Washington Water Power | | | | | | | | | | | | | | | | | | | | | | | | | |

PRINT IN BINDING



# Colorado

## Public Service Co. of Colorado

To quiet the many rumors afloat regarding just what we are doing with respect to fluorescent lighting, our policy is to engineer each installation so as to obtain from a minimum of 25 to 50-ft. candles in general lighting. We have made several installations approaching 100-ft. candles. We believe that this type of lighting is to remain with us and therefore are seeking all possible knowledge concerning it. When these installations were made, it appears that this type of lighting was a very good public relations builder. As a matter of policy, however, they have been made only upon requests of our customers, and as yet we are not actively promoting fluorescent lighting.

During 1939 we have had a very nice increase in our commercial lighting business. Five of our major downtown business streets have been illuminated with 16,000 lumen mercury vapor and 400 watts of Mazda per unit. It is contemplated that during 1940 the balance of our major downtown business streets will be similarly illuminated.

During 1939 two viaducts and two underpasses were illuminated with 10,000 lumen sodium units. In 1940 it is expected that two more viaducts and one more underpass will be similarly illuminated.

In domestic lighting during 1939, we have maintained a domestic lighting crew consisting of 22 territory salesmen who have made light conditioning surveys and demonstrations in the home. By this means we have been successful in increasing our sales of I. E. S. lamps very considerably. We expect to continue this policy through 1940 with probably a slightly enlarged crew.

Our figures in the tables include only company sales. The amount of dealer sales are not available. Trade-ins of our used ranges are included in our figures. Saturation figures are a rough estimate based on experience.

We participate in the activities of the Rocky Mountain Electrical League, which is an organization to promote the sale of all electrical appliances, adequate wiring, better lighting, dealer cooperation and co-ordination of all branches of the electrical industry; that is, manufacturers, jobbers, distributors, dealers, contractors and utilities.

At Christmas time we participated in an electrical show sponsored by the Rocky Mountain Electrical League and the *Denver Post*. Recently we brought in Helen Jacobs' puppet show demonstrating the value and desirability of adequate and proper illumination in the home. This show was presented to various groups and schools throughout the territory.

In our fall appliance sales campaign, 42 of our salesmen won an expense paid trip to Notre Dame-U. S. C. football game at South Bend, Indiana.

We maintain an electric institute also to which various organizations and clubs are invited to hold meetings without charge for the use of our facilities. We only require that we be given a few minutes during their meetings to present the story of better lights, better sight. In presenting such a story, we use lecturers and moving pictures in a properly illuminated auditorium. In conjunction with such auditorium, we also maintain properly illuminated and appointed living room and kitchen.

During the year, changes in our domestic rates were made to reduce the first block from 6c to 5c for the first 40 kw.-hr. Previously it was 5c thereafter, but now the next block of 70 kw.-hr. is 4c and 2½c thereafter. At this rate, electric range use is encouraged.

Territory served is urban, agricultural, and the major industry mining. Improved business conditions prevailed. Natural gas and coal are the competing fuels. We do sell natural gas. Major jobs in the year included complete electrification of two new coal mines totaling 2,000 h.p. We are looking forward to further growth in both mining and industrial fields with about the same amount of new loads connected in 1940 as in 1939.—*G. B. Buck, General Commercial Manager.*

## Southern Colorado Power Co.

A general improvement as the result of our lighting program in 1939 and more acceptance of our promotional

## 1939 ACCOMPLISHMENT

| COMPANY | No. of resident customers | Average annual kw.-hr. per resident customer | kw.-hr. increase 1939 | Spent for appliances | Average per home $ | Ranges sold per 1000 homes | Water heaters sold per 1000 homes | Refrig. sold per 1000 homes | Washers sold per 1000 homes | Ironers sold per 1000 homes | IES lamps sold per 1000 homes | %* of total volume sold by dealers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alameda, City of | 10,703 | 1,023 | 52 | | | 16 | 1.4 | 18.4 | 12.2 | 4.3 | | 100 |
| B. C. Elect. Rw. Co. | 109,000 | 1,025 | 22 | 2,129,000 | 18.50 | 10 | 1.2 | 21 | 29 | 1.1 | 83 | 77.5 |
| Burbank, City of | 10,028 | 850 | 22 | | | 42 | 10 | | | | | 100 |
| Calif-Oregon P. Co. | 28,300 | 2,250 | 83 | | | 55.5 | 43.3 | 56 | | | | |
| Central Arizona L. & P. | 25,461 | 1,038 | 63 | 825,000 | 35 | 7 | 2.4 | 86.6 | 74.6 | 5.7 | 31.7 | 98 |
| Coast Counties G. & E. Co. | 19,978 | 971 | | 25,000 | | 7.6 | | | | | | |
| Eastern Oregon L. & P. | 6,320 | 910 | 60 | 175,000 | 28 | 30.6 | 12.2 | 76.6 | 76 | 6.6 | 79.3 | 70 |
| Glendale, City of | 24,300 | 1,010 | 39 | 4,800 | | 12.7 | 1.4 | | | | | |
| Grays Harbor R. & L. Co. | 9,600 | 650 | 32 | 250,000 | 26 | | | | | | | 100 |
| El Paso Electric | 21,139 | 1,120 | 32 | 661,500 | 30 | 14.5 | 12.5 | 67.2 | 12.3 | 2.1 | 181.9 | 66 |
| Idaho Power | 52,200 | 1,836 | 117 | 2,974,924 | 59.49 | 67.3 | 31.9 | 90 | 89.7 | 5.7 | 107 | 85 |
| Los Angeles B. P. & L. | 396,000 | 900 | 62 | 19,500,000 | 49.24 | 16.4 | 6.3 | 126.2 | 70.7 | 12.6 | | 100 |
| Montana Power Co. | 69,000 | 870 | 31 | 230,000* | | 18.5 | 2.4 | 86.8 | 87 | | 221 | 100 |
| Mountain States P. Co. | 49,200 | 1,280 | 33 | | | 28.5 | 10 | 73 | 53.4 | 4.8 | 69.3 | |
| Nevada-Calif. Elect. | 25,500 | 1,400 | 30 | | | | | | | | | |
| Northwestern Elect. | 31,520 | 1,421 | 67 | 2,122,041 | 67.32 | 52.3 | 14.9 | 108.2 | 106.9 | | 281 | 100 |
| Pacific G. & E. Co. | 690,000 | 990 | 45 | 2,500,000 | 43.75 | 5.6 | 4.3 | 67.2 | 49.2 | 9.2 | | 90 |
| Pacific Power & Light Co. | 56,700 | 1,606 | 51 | 2,934,000 | 52.00 | 34.6 | 22.6 | 106.9 | 100.5 | 8.4 | 273 | 89 |
| Pasadena, City of | 27,554 | 986 | 57 | | | 7.1 | 3.8 | 65.4 | | | | 100 |
| Portland Gen. Elect. Co. | 120,500 | 1,380 | 63 | 2,500,000 | 20.00 | 36.9 | 16.1 | 43.9 | 41.3 | 5.8 | 136 | 100 |
| Public Service of Colorado | 112,270 | 700 | 47.2 | 990,000* | | 5* | 1* | 14.6* | 5.9* | 1.4* | 66.7* | 0* |
| Puget Sound P. & L. Co. | 172,450 | 1,391 | 135 | 3,423,304 | 50.00 | 31 | 17.1 | 63 | | | 139 | 82.3 |
| San Diego C. G. & E. | 77,346 | 954 | 58 | 3,500,000 | 40.00 | 6.8 | 6.1 | 105 | 55.7 | 9.2 | 73.7* | 93.3 |
| San Joaquin Pr. P. G. and E. | 96,500 | 1,270 | 16 | 3,004,143 | 2.15 | 14.2 | 7.6 | 71 | 50.8 | 7 | 36.3 | 100 |
| Seattle, City of | 81,000 | 1,490 | 106 | 3,322,938 | 19.31 | 31.6 | 19.9 | | | | | |
| Sierra Pacific Pr. Co. | 11,800 | 1,466 | 20 | 750,000 | 63.00 | 75.6 | 23.7 | 90.8 | | | | 100 |
| Southern Calif. Edison | 433,800 | 977 | 32 | 14,000,000 | 35.00 | 10.9 | 3.3 | 83 | 65 | 7.7 | 34 | |
| Southern Colo. Pr. | 21,057 | 883 | 45 | 190,241* | 25.00 | 21.3 | 7.4 | 93.1 | 98.7 | 10 | 97.7 | |
| Tacoma, City of | 32,325 | 1,900 | 96 | | | 46.4 | 18.5 | | | | | |
| Tucson G. E. L. & P. | 14,116 | 932 | 21 | 300,000 | 21.25 | 10.7 | 3.5 | 107.1 | | | | 100 |
| Utah Power & Lt. | 104,346 | 1,140 | 82 | 6,162,038 | 59.00 | 33.3 | 9.4 | 90.4 | 85.6 | 5.7 | 155 | 90 |
| Washington Water Pr. | 68,631 | 2,060 | 75 | 3,754,740 | 54.81 | 38 | 35.2 | 92 | 82.7 | 5.4 | 22.6 | 90 |

*Company figures only.

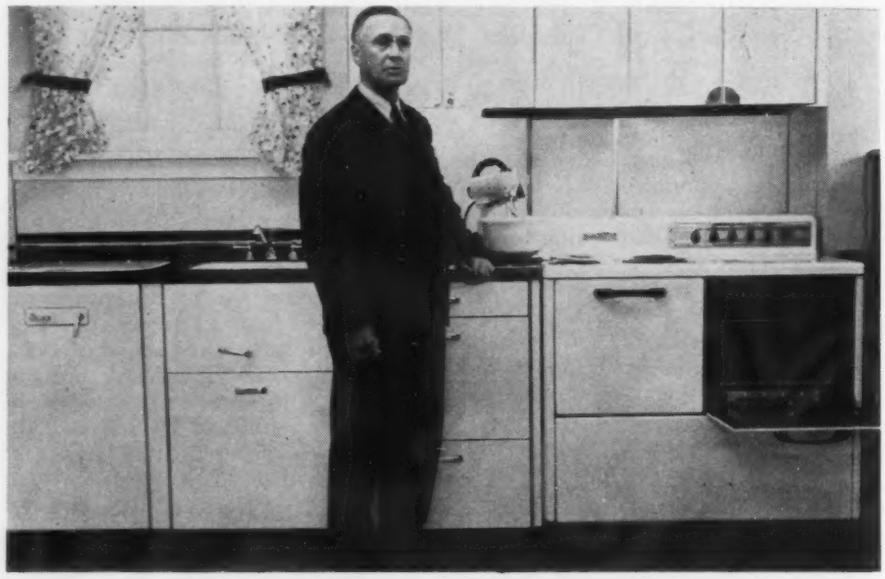
efforts leads us to expect continued improvement in 1940. As to fluorescent lighting, we have no special promotion and recommend it only when adapted to particular installations.

We have nine domestic salesmen and two commercial lighting men. Most of domestic lighting is handled by home lighting specialists.

Territory served is urban, agricultural and industrial. Business conditions were fair. Competing fuel was gas sold by other utilities. During the year our rates were changed to an objective rate plan in August. This brought approximately 10% reduction.

Dollar volume of sales in the tables are those of company sales as we do not have figures on dealer sales except in number of units. Saturation figures are a rough estimate based on experience.—*G. W. Milliken, Vice President in Charge of Sales.*

W. N. Clark, president of the Southern Colorado Power Co., is proud of the new electric kitchen display recently installed in the showrooms of the company at Pueblo, Colorado



# Idaho

## Idaho Power Co.

To stimulate more activity on the low-use customers, Idaho Power Co. has changed its dealer and salesmen's compensation set-up. Salesmen have all been placed on a straight salary with a company sales quota reduced by 20 per cent to stimulate more activity on the low-use customer. During 1939, various domestic rates were combined. We have now one general service rate. The residential price per kw.-hr. is now 2.67c.

For dealer activity, we hold classes on sales training generally with the wholesalers and manufacturers holding classes pertaining to products. As to the trade-in problem, the utility sets the pace and does no trading on electric refrigerators at all.

The estimates of replacement and saturation are based on company sales figures.

The company has 32 domestic salesmen, 9 combination men. Respecting fluorescent lighting, we promote it where applicable and are showing customers how it may be applied. General business conditions were about the same as in 1938. General character of the territory is agricultural and major competing fuel is coal. We are looking forward to an increase in industrial load amounting to 1,185 kw. in 1940.—*R. E. Gale, General Sales Manager.*

# Montana

## Montana Power Co.

Average industrial load in September of 1939 was about 25 per cent higher than in the same month in 1938 because of increases in mining and allied industries. Similar increases seem to be indicated and we should experience a continuation through 1940 of the improvement noted in the latter part of 1939. Our annual average consumption for industrial customers is high because of the number of large mining customers we serve.

In our commercial lighting program, substantial increases in loads were reflected in actual revenue. Great progress was made in winning cooperation of architects, contractors, etc. We are very careful about fluorescent lighting, advocating it only as plus lighting at present. We have 34 domestic salesmen, 16 lighting salesmen. Major competing fuel is coal. We sell natural gas in some of our territory.

In our domestic appliance figures, ironers are not kept separate from other appliances. Neither are air heaters. Therefore no separate figures on these are available. The lamp figure includes other portable lamps as well as I.E.S. lamps. The dollar volume figure is only for company sales. We have no means of estimating dealer sales volume.—*I. L. Comstock, Asst. to Vice President.*

IDAHO POWER CO.'S Boise service building, recently christened by 400 employees of the company and their families, is a modern, well-arranged headquarters for service work. It includes a warehouse, machine shop and garage. Three locations were formerly used. Now these divisions, manned by 70 men, make this $125,000 concrete plant their new base

# Nevada

## Sierra-Pacific Power Co.

Dealers in our territory have continued to do an outstanding selling job during 1939. Kilowatt hour consumption continued to rise, now reaching the figure of 1,466. The company is pleased that its simple policy in respect to dealer sales of all merchandise is continuing to operate satisfactorily. We will continue our cooperative working plans with electrical dealers, architects, etc. in 1940.

We also conduct cooking schools in cooperation with dealers and newspapers and plan to continue this activity. The territory served is urban, agricultural and industrial and the competfuel coal. The company also sells manufactured gas. We have one lighting salesman who continues to do the lighting promotion work in the territory in cooperation with dealers and contractors.—*A. L. Pierce, New Business Dept.*

# Oregon

## California-Oregon Power Co.

In explanation of the figures in the tables respecting this company, the qualities given represent nine months' figures plus 80 per cent of actual sales for October, November and December of 1938, which makes for a conservative estimate. No records are available except for ranges, refrigerators and water heaters and estimates of total dollar volume are difficult to make.

We employ 10 part-time lighting salesmen part of the year on lighting sales of our total of 32 domestic salesmen. We have four commercial lighting salesmen and one general salesman. The commercial lighting increases will approximate 1,000 kw. in 1939. Our policy on fluorescent lighting is to stimulate its use for supplemental lighting only.—*Glenn Jackson, Vice President in charge of Sales.*

## Eastern Oregon Light & Power Co.

Since the classifications specify that rural customers are those billed under a distinct farm rate, this company lists most of its farm customers as residence customers. Likewise, commercial and industrial customers are listed in one classification. There was a change in the domestic rate during 1939 of approximately 7 per cent reduction. Most of the territory served is agricultural with a fair business condition prevailing. Wood and coal are the competing fuels.

The company employs four combination salesmen and has no announced policy respecting fluorescent lighting.—*Leroy A. Grettum, General Manager.*

## Mountain States Power Co.

Since we do not merchandise and because the figures reported by dealers are not accurate except on the ranges, refrigerators and water heaters, our estimates are based on as much information as we have available. We cannot hazard a guess as to the amount in dollars of domestic appliances sold by dealers. Plans for 1940 are not complete and therefore are not reported either.

Ranges sold include 1151 new ranges and 256 replacements. Also the majority of the 160 evaporative coolers are in our Wyoming Division. The largest percentage of these coolers have been installed in commercial establishments.

We have estimated the annual kw.-hr. consumption but from figures we have now, this is quite accurate. The rate of increase in the residential field does not show as large as in some years in the past due largely to the fact that we have added many hundreds of new rural customers to our lines whose use is relatively small. This naturally tends to cut down the rate of increase even though we have had substantial improvement in kw.-hr. sales to our customers.

The 7,300 customers shown under rural are designated by us as farms since the only record we keep of rural customers is that portion which can be considered farm accounts or actually in the farming business. Our records for agricultural loads for 1939 and new loads added are not sufficiently complete to report on at this time. Increased industrial loads have mainly come from

## DEALERS—HOME SERVICE—PROMOTION

| COMPANY TERRITORY | No. of dealers | WHICH DO MAJOR BUSINESS* | | | | | HOME SERVICE | | | KITCHEN PLANS | | | | Name of promotional association or agency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dept. | Furn. | Mail Order | Elect. | Others | How many girls | Do they sell | Promote light sales | By utility | By ind. bureau | By mfg. | By dealer | |
| Alameda, City of | 5 | 3 | 4 | 2 | 1 | 5 | | | | x | | | x | Pay part of dealer advertising |
| B. C. Elect. Rw. Co., Vancouver | 120 | 3 | 2 | | 1 | 4 | 4 | No | Yes | x | | x | | Electrical Service League of B. C. |
| B. C. Elect. Rw. Co., Victoria | 12 | 2 | 3 | | 1 | 4 | 2 | No | No | x | | | | Electrical Service League of B. C. |
| Burbank, City of | 9 | | 2 | 3 | 1 | | 1 | No | No | x | | | | Electrical Development League of So. Calif. |
| Calif-Oregon P. Co. | 33 | 3 | 4 | 2 | 1 | 5 | 2 | No | Yes | x | | | | |
| Central Arizona L. & P. | 123 | 5 | 2 | 1 | 3 | 4 | 7 | Yes | Yes | | | | | |
| Coast Counties G. & E. Co. | | | | | | | | | | | | | | |
| Eastern Oregon L. & P. | 16 | | | | | | | | | | | x | | |
| El Paso Electric | 36 | 2 | 1 | 3 | 4 | 5 | | | | x | | | | Elec. Refrig. Bur. of El Paso, Evap. C. D. A. |
| Glendale, City of | 18 | 2 | 3 | | 1 | | 1 | No | No | | | x | | Electrical Development League of So. Calif. |
| Grays Harbor R. & L. Co. | 10 | | 2 | 1 | 3 | 4 | 1 | No | No | | | | x | |
| Idaho Power | 315 | | | | | | 20 | Some | Yes | x | | x | | Electric Equipment Ass'n. |
| Los Angeles B. P. & L. | 200 | 3 | 4 | 2 | 1 | 5 | 21 | No | No | x | | | | Electrical Development League of So. Calif. |
| Montana Power Co. | 200 | | | | 1 | | 15 | No | Yes | | | x | | |
| Mountain States P. Co. | 117 | | 2 | 4 | 1 | 3 | 4 | No | Yes | | | x | x | |
| Nevada-Calif. Elect. | 50 | 5 | 1 | 4 | 2 | 3 | 6 | No | No | x | | | | |
| Northwestern Elect. | 711 | 1 | 2 | | 3 | | 9 | No | Yes | | x | | x | |
| Pacific G. & E. Co. | 1,180 | | | | | | | | | | | | | Elec. Appl. So.; P. C. E. B. No. Div. |
| Pacific Power & Light Co. | 382 | 5 | 4 | 1 | 3 | 2 | 20 | Yes | Yes | | | x | | |
| Pasadena, City of | 52 | 4 | 3 | 5 | 1 | 2 | 1 | No | No | | | | | Electrical Development League of So. Calif. |
| Portland Gen. Elect. Co. | 219 | 3 | 2 | 4 | 1 | 5 | 7 | No | No | x | x | | | Central Appraisal Board |
| Public Service of Colorado | | | | | | | 1 | No | Yes | | | | | Rocky Mountain Electrical League |
| Puget Sound P. & L. Co. | 493 | 1 | 2 | 4 | 3 | 5 | 17 | No | Yes | x | | x | x | Electric Club of Washington |
| San Diego C. G. & E. | 200 | 4 | 3 | 1 | 2 | 5 | 2 | No | No | | | | | Bureau of Radio & Elec. Appl. |
| San Joaquin Pr. P. G. and E. | | 4 | 3 | 2 | 1 | 5 | 10 | No | Yes | x | | | | Electric Appliance Society |
| Seattle, City of | 100 | 2 | 3 | 1 | 4 | 5 | 2 | No | No | x | | x | | Electric Club of Washington |
| Sierra Pacific Pr. Co. | 55 | 4 | 2 | 3 | 1 | 5 | 1 | No | No | | | x | x | |
| Southern Calif. Edison | 363 | 5 | 4 | 3 | 2 | 1 | 10 | No | No | x | x | x | x | Electrical Development League of So. Calif. |
| Southern Colo. Pr. | 36 | 5 | 4 | 1 | 2 | 3 | 1 | No | No | x | | | | Rocky Mountain Electrical League |
| Tacoma, City of | | 1 | 2 | 3 | 4 | 5 | 2 | No | Yes | x | | x | | |
| Tucson G. E. L. & P. | 21 | 4 | 3 | 1 | 2 | 5 | | No | No | | | | x | |
| Utah Power & Lt. | 698 | 2 | 3 | 4 | 1 | 5 | 23 | Yes | Yes | | | x | | Electrical League of Utah |
| Washington Water Power | 150 | 1 | 3 | 4 | 2 | 5 | 27 | No | Yes | | x | | | Inland Empire Elec. Equip. Ass'n. |

*Arranged in order of the volume they do.

the lumber industry. We have had an increase in other small industrial loads as well as an improvement in the oil fields where we operate. Gas and wood are the principal fuels. We do not sell gas. We have six combination salesmen on promotional work and have carried successful promotions in lamp bulb sales, I.E.S. lamps, domestic lighting campaigns and commercial lighting. Our policy on fluorescent lighting has not yet been completed.—*H. E. Farris, Sales Manager.*

## Northwestern Electric Corp.

Our dealer plan of merchandising, in which the company sells nothing, is working satisfactorily and will be continued. We have a monthly publication mailed to all dealers and their salesmen, conduct cooking demonstrations, help on sales calls with our men and conduct sales meetings. We usually hold a Northwestern Electric Co. and newspaper combination cooking school in each town served by our company.

Replacement and saturation figures were based on a field check of 18,375 residential accounts. These checks showed over 100 per cent radio saturation, meaning more than one set per home. Trade-ins of used ranges are not included in the figures given.

In the lighting field, we are recommending fluorescent lighting where conditions are right. We have five full time lighting salesmen, four on part time, 17 domestic salesmen cooperating with dealers, six on industrial lighting part time and seven on other sales part time.

In 1939 we had a commercial load increase of 1995 kw., industrial 215 kw. which were sales to present consumers and increases sold to new customers. For 1940 commercial expectancy is 1900 kw., industrial 221 kw. We look for load development somewhat above normal in 1940.

Major competing fuel is manufactured gas sold by another utility. Territory served is urban, agricultural and industrial. Two large paper mills account for our high average annual consumption for industrial customers.—*J. C. Plankinton, Manager Sales Bureau.*

## Pacific Power & Light Co.

Most stimulating of the promotional activities for dealer sales during the year 1939 were 24 radio shows in which 95 dealers participated. There was a total attendance of 34,172 people at these shows. Other work was carried on dealer meetings, monthly dealer campaign booklets and campaign contact work.

Effective March 1, 1939, substantial reductions were made in rates applicable to residence service in all urban and rural territories served by the company. These reductions generally were in the form of decreases of ½c or more per kw.-hr. in the top block rate with a reduction of ¼c per kw.-hr. to 2¾c per kw.-hr. in the first block following. No reduction was made in the tail-end rate of 2c per kw.-hr. Saturation and replacement figures are based on actual percentage of previous year's sales.

Pacific Power & Light's radio shows in 1939 were popular everywhere they were held. Here's part of a crowd at one of the shows

In the lighting field we advocate use of fluorescent lighting to supplement incandescent and increasing intensity for fluorescent alone for specific application. We have no separate program on lighting, but combine it in all service selling. Our sales personnel consists of 28 domestic, 10 commercial and two combination salesmen. Character of the territory is agricultural; business conditions were fair. Competing fuel is wood and gas. The company sells neither. Outstanding new installations in 1939 were in refrigeration and power for fish packing plants.—*E. D. Leonard, Commercial Manager.*

## Portland General Electric Co.

We are very much pleased with the way in which dealers in our territory have sold electric ranges and water heaters this year, exceeding the sales for 1938, when the company, for a part of the year, maintained its own sales organization. A great deal of credit for this may be given to George Madison in charge of dealer promotion in Portland and vicinity, and Fred Hodge, in charge of dealer promotion in the towns and rural areas outside of Portland.

We wound up the year 1939 with an average consumption per domestic customer of 1,390 kw.-hr. and an average revenue per domestic customer of 2.6c per kw.-hr.

Unfortunately, we have only accurate and dependable figures covering the sale of electric ranges and water heaters and take the best figures we can from wholesale distributors and dealers for refrigerators, washers and I.E.S. lamps. We are reporting our best estimate of the gross dollar volume of domestic appliance business on our lines, not including sales to customers by Northwestern Electric Co. in that portion of our territory in which they are in competition with us. I do not know just how much should be added to our estimate to cover the territory served by the two companies. These figures are all dealer sales except for employee purchases and disposal of company repossession, this year only 95 ranges and 155 water heaters.

The continuation of the dealer cooperative program is anticipated. Dealers attempt to handle the trade-in problem through their central appraisal board to which the utilities contribute along with the majority of dealers.

No changes in domestic rates were made except for easing of restrictions on metered water heater service to accelerate water heater sales to some extent without changing the kw.-hr. rate.

Our sales staff is very much decreased. We have five men working part time on domestic promotional work, two on lighting and four combination. Our light and power sales organization, under the direction of A. H. Greisser, while small, has done an outstanding job this year. We are particularly pleased with the commercial cooking and heating loads which have been added, as well as power in commercial and industrial lighting. Commercial cooking and heating of course is not covered in the questionnaire but we will add this year approximately 1,300 kw. on heavy duty cooking loads, with an E.A.R. and not less than $26,000.

The volume of promotional load in 1939 for commercial and industrial lighting will be approximately $30,000 annual revenue from 1,000 kw. of connected load and usage of 1,300,000 kw.-hr. For that program contemplated for 1940 includes a campaign featuring "catch-on" socket type units for small commercial users, a trial installation plan for larger commercial installations of approved design and intensive promotion of adequate wiring directed to architects and contractors.

Our policy on fluorescent lighting is to encourage its use for decorative effects, for showcase lighting and for any installation where fluorescent best fits the illumination requirements. We request power factor correction to 80% on installations over 300 volt-amp. (tested load) and assess a billing demand at 80% power factor if the installation is not corrected.

Territory served includes urban, agricultural, industrial and major industries are lumber and wood pulp which accounts for the exceptionally high industrial consumption average. Business conditions were fair. Major competing

fuel is gas served by other utilities. We look forward to normal increases in all commercial and industrial lines with considerable increase in the use of electric heat in the processing of metals, core baking, etc.—*A. C. McMicken, General Sales Manager*

# Texas

## El Paso Electric Co.

The character of territory served by El Paso Electric Co. is 80% urban and 20% agricultural. Its high industrial kw.-hr. figure comes from three customers who use large blocks of power. Otherwise, general business conditions in the territory were 10% off, reflected also in a slight decrease in appliance volume. Natural gas is the competing fuel served by other utilities.

The company maintained 12 domestic salesmen, two lighting commercial salesmen, four other salesmen and one industrial lighting man, two on combination sales and three others on general sales. The lighting promotion of the past years will be continued. Respecting fluorescent lighting, we have encouraged the use of this light source for showcase, decorative and display lighting. In the domestic lighting field, two men promote these sales. In dealer activity, the company gives active support to the Electric Refrigeration Bureau of El Paso and the Evaporative Cooler Dealers' Assn.

A new rate schedule was introduced in 1939 slightly increasing the rates in the first block. Under the old rates, the first 35 kw.-hr. were sold at 5½c. Under the new rates, the first 40 are sold at 5½c. In both the cases, the next 60 are at 4c and all in excess at 2c.—*R. K. Banner, Merchandise Manager.*

# Utah

## Utah Power and Light Co.

Report for Utah Power and Light Co. also includes that for the Western Colorado Power Co. General business conditions in 1939 were improved, which fact is reflected in increases of sales in virtually all classifications of load. Of the gross sales, the company did but 9.4 per cent of the total, the dealers doing 90.6 per cent of the total of $6,162,038. Average annual kw.-hr. consumption was 1,140 for residential and 996 for the farm customer, a healthy increase over the 920 for farm customers for last year.

In the appliance figures in the tables, trade-ins are not counted in company sales but are for dealers. In other words, second hand ranges are counted if they are returned to the line.

The home service girls numbering 20 advisors and three supervisors only sell certain appliances but none of the major appliances. They do promote lighting sales. We carry on a continual training program and at the present time a sales training course under the sponsorship of the Electrical League of Utah for dealers and dealer salesmen.

A rate reduction was made in September.

Territory served is urban, agricultural and industrial with the major industries metal and coal mining. Natural gas is the competing fuel served by other utilities. The company employs 44 full time domestic salesmen, four on part time. Commercial salesmen, all-service, number two supervisors and fifteen full time and six part time men. Industrial all-service men include two supervisors, six full time and six part time. Our lighting program in 1939 increased the load in commercial lighting 3,908.30 kw.; in industrial, 444.22 kw. The residential activity resulted in 17,626 portable lamps, 31,485 other lamps and fixtures sold by company and dealers.

Outstanding new installations during 1939 were at Park City Consolidated Mines Co., submersible pumps; Utah Ice and Storage Co., Ogden, quick freezing; and at the Veta Mines Co., Telluride, Colo., metal mining; and Rico Argentine Mining Co., Rico, Colo., metal mining. Considerable activity in metal mining is anticipated in 1940 but new business volume will be about that of 1939. — *W. A. Huckins, Sales Manager.*

# Washington

## Grays Harbor Railway & L. Co.

Owing to the fact that the public utility district in this country proposes to acquire our electrical facilities, we are unable to make definite plans for cooperative dealer activities in 1940. Over a year ago, we discontinued our merchandising department and since that time have cooperated with the local dealers in various campaigns and activities.

The average annual consumption for all classes of service for 1939 is estimated to be 3,700 kw.-hr. Actual in 1938 was 3,380 kw.-hr. Sales figures from dealers have not been available. For the education of dealers, the appliance manufacturers' personnel call on dealers and furnish information. They have also correspondence sales courses, hold meetings and provide sales literature.

The territory is dominantly industrial with the major industry lumber. Business conditions were fair and competing fuel is wood, oil and gas served by other utilities.—*H. G. Kelsey, Assistant to the General Manager.*

## Puget Sound Power & Light Co.

Important events of the year in which we participated in a promotional way in the interests of the dealers were:

*Electric Water Systems Campaign*—In cooperation with electric pump distributors, including dealer sales meetings over the territory. The sales theme was "Every Sale First a Prospect." The company sponsored a prize electric pump dealers' window display contest. Dealers held an open-house month.

*Modern Kitchen Bureau's national program*, for which we provided promotional display material.

*"Save Your Vision" Week*—National activity in which we tied in the Better Light-Better Sight movement, the dealers handling such equipment with the professions who specialize in the examination and care of the eyes. Publicity was dramatized with specially prepared skits on our radio time.

*National Adequate Wiring program*, has received our constant cooperative attention, not only in the way of supporting a local adequate wiring bureau which we had a part in organizing, but the distribution of informative literature to our customers, newspaper advertising, and extensive radio time featuring timely and appropriate programs.

A highlight of this activity was a mammoth Home Builders Exposition in the Seattle civic auditorium, in which a model home was constructed indoors, equipped with adequate wiring. Also among the hundreds of booths was a cooperative electrical industry booth in which the benefits possible from adequate wiring were demonstrated to the thousands who attended the exposition.

*Electric Home and Farm Authority* financing service we have provided for dealers' appliance sales. It has proved of great value to the retailers who are moving a constantly increasing amount of electrical appliances because of this service.

*Better Light-Better Sight* activity this year was promoted in the last quarter as an all-industry "Light Conditioning" program for home, farm, commercial, industrial, and highway lighting. A series of 12 dealer and 12 employee meetings were held during which a well worked out prospectus of the potential market of $51,000,000 for the equipment dealers and wiring contractors was presented, based on the known

Where People PREFER TO BUY
GOOD LIGHTING IS THE SIGN OF A GOOD UP-TO-DATE STORE
GOOD LIGHTING IS GOOD BUSINESS
ELECTRICAL EQUIPMENT FOR MODERN HOMES
Customers buy more and faster in a LIGHT CONDITIONED STORE
THE EYES ARE THE REAL BUYERS . . . THE LIGHT-CONDITIONED STORE HELPS MERCHANDISE SELL ITSELF.
The Biggest on Earth
Highlights & Radio Log FALL and WINTER SEASON 1939 - - - 1940
40 HINTS
For Improving Sales
—inexpensively
TO HELP YOU SELL MORE
Electrical Equipment
The More Appliances the Customer uses the Lower Her Kilowatt hour rate!
Step Up YOUR ELECTRIC RATE
. . . and—
A Lower Kilowatt Hour Rate Makes It Easier For You To Sell More Appliances!

**PROMOTIONAL MATERIAL, such as direct mail, booklets, inserts for salesmen books, and customer giveaways were on a majority of 1939 utility programs, either directly or through cooperating leagues and associations. One of the most successful of these items was the San Diego County Bureau's Radio Log (bottom left) which ran into a 40,000 printing order. Other utility promotion represented here are PG and E (bottom center), Idaho Power (bottom right) and British Columbia Electric Railway, whose light conditioning inserts are shown at top**

light conditioning needs for safe, comfortable and profitable seeing for the nearly 200,000 existing customers of our company.

One of the features of the program was a dealers' I.E.S. window display contest for which we provided 21 cash prizes for the best windows during October.

Slide films with men and women characters utilizing back-stage microphone and voice amplifiers brought a carefully prepared script to the audience, while a visible master of ceremonies conducted the program and interviews.

*Home service section*—A continuous program of promotional activities for greater acceptance of the use of electricity in the Home for lighting, cooking, refrigeration and other household purposes is being carried on by the home service department of the company. Each purchaser of a new range is contacted shortly after the range installation and given instruction on its use by a home service representative, assuring complete satisfaction in its use. Also, requests for assistance with electrical equipment are promptly followed up and are resulting in continuous use of appliances placed on company service.

Light conditioning surveys and recommendations are made for the homes of customers and are resulting in great improvements in the lighting standards of these homes. The members of this section cooperated with the General Electric Co. in their nation wide empty socket inventory survey. Over 400 surveys were made in this area.

All installations of household electrical equipment purchased from dealers under the E. H. and F. A. plan are confirmed by the Home Service staff and assistance is given in the operation of the equipment purchased. Appliance demonstrations and home lighting lecture demonstrations have been presented to thousands of persons visiting the displays sponsored by Puget Power at local fairs. Also talks and demonstrations have been given for women's groups and school classes for the promotion of lighting and electric cookery.

A series of newspaper cooking schools have been carried on to demonstrate the advantages of electric ranges and refrigerators. Also the promotion of electric cookery and better lighting has been featured in three fifteen minute home service radio broadcasts conducted by the Department each week.

*Commercial, Industrial, Agricultural*—We have 16 salesmen devoting time to commercial and industrial sales. In

1939 this activity added 2,780 kilowatts of load, representing $110,000 in estimated annual revenue. Special emphasis is to be placed on small commercial customers in 1940. We will continue to promote fluorescent lighting in cases where it is particularly beneficial to the customer. Wherever fluorescent lighting is to be considered a complete lighting and economic analysis is provided.

Our farm electrification department is again responsible for our display at the Puyallup Fair, which was attended by 265,000 people. In addition to the farm contact work carried on by this department, several new applications for electricity on the farm were developed, among which are the poultry waxer, electric field cultivator, and the electric clothes dryer.

From Jan. 1, 1939 to Sept. 30, farm electrification men have spoken to and taken part in 21 farm meetings and have instigated and written numerous educational newspaper articles with the idea of acquainting farmers with the benefits of different uses of electricity on the farm.

The prospects for 1940 in the Puget Sound area are particularly bright. The lumber and allied industries are for the most part working at full capacity, and if this continues we believe that it will have a very beneficial effect upon electrical merchandise sales for this coming year.—*Patrick Johnson, General Sales Manager.*

## Seattle City Light

Sales of major appliances by the city and by dealer to customers on our lines have been greater in number than at any time in the past. This includes automatic storage water heaters. Sales of other electrical appliances which we do not carry have also shown a healthy increase.

One of the most favorable trends of the past year has been the closer relationship between this utility and dealers. This cooperation has enabled dealers to sell twice as many major appliances as in other years. City Light has in no way subsidized the dealers nor do they expect such paternalism, but they do expect that we give their customers the same consideration we give our own, thereby putting their customers on the same basis as ours. We consider our dealer set-up increasingly satisfactory and are anticipating a year of exceptional activity on the part of the dealers.

Promotional activities included our annual all-electric home building and manufacturing exhibit in the large Pacific Auditorium attended by over 80,000 persons. Weekly cooking schools were held in our own centrally located auditorium or in outlying districts under the joint sponsorship of local dealers. Two waterheating campaigns were conducted to acquaint the public with the advantages of automatic waterheaters.

Subsidizing part of the cost of wiring for ranges and water heating and extending the offer to all dealers who sell ranges or water heaters on city light department services has been extended this year. A monthly bulletin is being mailed with light bills giving family hints to the users of electricity as well as other information of general interest to customers.

**Market Trend**

Dealers during 1939 have showed a marked trend toward selling ranges and water heaters. Printed information is furnished dealers on electrical uses. A pamphlet was printed by the Department promoting adequate wiring and the use of electrical appliances under the caption "Electrical Tips at Your Fingertips." Distributors arranged pep and instruction meetings with dealers to promote sales of merchandise.

Our figures are estimates of sales by the lighting department only since we have no dealer sales in the territory.

Effective Sept. 1, a rate reduction of the first block of 40- kw.-hr. was cut from 5c to 4½c and the second block of 200 kw.-hr. at 2c was cut to 180 kw.-hr. at 2c.

In the lighting field for the first ten months of 1939, the illuminating division extended its services and advice to some 147 customers and averaged an increase of 1.33 kw. on each job. No extensive campaign other than newspaper advertising has been used to promote this service. No change in the existing plans is contemplated in 1940. Until further developments in additional power factor corrective equipment is available, we are pushing fluorescent lighting.

Our sales staff consists of 15 domestic salesmen, one lighting commercial salesman, one industrial lighting and two combination men. Territory of the utility is largely urban and industrial. Business conditions were better than good. Gas was the competing fuel handled by another utility. If conditions continue to improve, it looks very favorable in 1940.—*P. C. Spowart, Sales Manager.*

## City of Tacoma

Two major newspaper cooking schools were held during the past year and several cooperative demonstrations of electric cooking. These were the major promotional events during the year. The lighting department only sells ranges and water heaters and dealers are making an increasing proportion of such sales.

The already low rates of Tacoma were reduced again, effective Jan. 1, 1939. The first and second steps were lowered for most consumers as a result of the elimination of the floor measurement basis.

No records are kept of dealer sales. Our figures on ranges and water heaters come from records of connections. About 7¾ per cent of our customers are suburban but not strictly speaking farm or rural customers. The territory is predominantly industrial with the major industries chemicals and lumber. Business conditions were good. Gas and coal were competing fuels sold by others.

We have five domestic salesmen, one combination commercial salesman who turns the business generated over to dealers. We have no definite policy as yet on fluorescent lighting for we see no reason why this load should not be encouraged.

Major increases in loads in 1939 were a new U. S. air field with a load of about 1,000 kw. and many smaller loadings. In 1940 we look forward to a new shipyard using about 1,000 kw.—*Harold W. Bartloe, Sales Manager, Light Division.*

## Washington Water Power Co.

There may be a slight tendency toward endeavoring to increase our gross merchandise sales in 1940 without in any way hurting the very fine activity of dealers in this territory. We feel that we can be more active in the sale of major appliances by personal contact and by seasonal stressing of table appliances and laundry equipment that will increase dealer sales as well as our own. In no way will we decrease our dealer coordination as outlined by the "Inland Empire Electrical Equipment Association" policy of this past year and which has resulted in mutual benefit to both the dealers and ourselves.

During the last year, changes in our residential rates, which included an optional combination residential rate, provides for the installation of an automatically controlled water heater of standard specifications. Possibilities of water heater sales brought out by this combination rate have stimulated dealer activity. A policy of proper installation of water heaters has been adopted by the company. The company will install at a relatively low cost (namely $15) a standard automatic water heater, the work being done by contractors. It will also insulate all exposed hot water pipes so as to give the customer the greatest water heating efficiency. Any dealer who displays actively and

sells water heaters is included in this program.

A greater effort will be made in each of our seven divisions to build a closer knit organization of dealers than has been possible in the past.

As to the figures in the tables, our industrial customer average consumption includes Grand Coulee Dam construction. This account runs about 84,000,000 kw.-hr. per year.

Character of the territory we serve is urban and agricultural. Business conditions were fair. Competing fuel was gas served by other utilities.

We have 55 domestic salesmen, 17 lighting salesmen and two combination industrial men. Our lighting program resulted in domestic lighting sales of 15,700 I.E.S. type lamps. The same number of sales are contemplated for 1940. Commercial lighting sales brought new load of 2,400 kw. The 1940 estimate on commercial lighting is 2,700 kw.

Industrial lighting in 1939 was 450-kw. increase. For 1940 it is estimated that we will add 500 kw. Not much growth in the general industrial load is contemplated but growth in the mining load is anticipated.

Our policy on fluorescent lighting is to recommend only high power factor fluorescent lighting equipment after analysis of various factors.

Outstanding events in the domestic promotion field were 1,026 cooking and lighting demonstrations to a total of 61,407 people in the year. Also, we conducted cooking and lighting classes for dealers.—*Lewis A. Lewis, Assistant general manager.*

# British Columbia

## B. C. Electric Railway Co.

No major changes were made in our dealer set-up during the course of the year other than the publication of an official valuation book for range trade-ins, composed by a committee of dealers. This with the trade-in agreement incorporated in our 1939 plan, did a great deal toward making trade-in practices more uniform throughout the territory although the situation is still far from satisfactory.

During the coming year no major changes in policy are contemplated but one or two minor adjustments have been made, mainly, the scaling down of installation concessions on electric ranges, and in advertising bonuses. These are best summarized as follows:

*1. Advertising*

*1939*—Advertising bonus of $5.00 on each electric range and $2.00 on each electric refrigerator, paid to dealers for all direct sales made by them.

*1940*—The same business will apply, but payment will only be made to dealers where proof of advertising used to the value of the bonus earned is furnished.

*2. Monthly Sales Report*

*1939*—A monthly sales report is received from all dealers and where no range or refrigerator sales are reported a bonus of $1.00 is paid to the dealer for making the report.

*1940*—The $1.00 bonus for sending in the report where range and refrigerator sales are not made will be paid only providing the dealer sales are in excess of $25.00 in the month.

*3. Range Installation Allowance for Existing Homes*

*1939*—$35.00 wiring allowance granted by B. C. Electric Rly. Co., Ltd., to customer toward cost of range wiring.

*1940*—$25.00 wiring allowance granted by company to customer toward cost of range wiring.

*4. Range Installation Transfer Allowance*

*1939*—Where customer has used electric range service for 5 years or more and is moving to an unwired home, company makes an allowance of $17.50 toward wiring cost.

*1940*—Allowance reduced to $15.00.

*5. Tie-in of Replacement Range to Existing Wiring*

*1939*—Company allowed free tie-in where cost did not exceed $4.00.

*1940*—No change.

*6. Duplex Homes*

*1939*—Company allowed tie-in where wiring already existed, up to $4.00, and also paid dealer advertising bonus on range and refrigerator sales made to duplex homes.

*1940*—All concessions eliminated on sales to duplex homes.

*7. Trade-In*

*1939*—Company allowed $20.00 trade-in for old electric range where new electric range, valued at $100.00 or more, was purchased. This applied to sales made by company merchandise department and by all recognized dealers.

*1940*—No change.

Out of a total of approximately 120 co-operating electric and gas appliance dealers there are 85 who sell electric appliances but not gas. Combination hardware and electric stores and electrical contractors account for approximately 50% of the business. Straight electric appliance dealers do about 40% of the total business. Department stores do about 3%. Only three department stores in the territory and one does not report sales through our department. The two stores sending in reports list only major appliance sales so it would be safe to estimate that this group, if a complete analysis was available, would show a much greater percentage of the total business.

Most of our promotions have been reported already; the General Electric Magic Kitchen; our regular series of city and rural homemakers' classes; and our domestic and rural exhibits at the annual Canadian Pacific Exhibition.

In the commercial field the company exceeded its 1939 quota of 3,550 kw. by about 10%. Its domestic lighting quota of 500 kw. was also reached. We have 27 domestic salesmen, 5 commercial lighting, 1 commercial power, and 3 on industrial power.

Business conditions were better, and in 1940 there is a possibility of a rayon mill, a pulp mill and some war industries. Sawmill waste is the major competing fuel. The company also sells manufactured gas. Irrigation and grass drying were two new applications of power developed in the agricultural field last year.—*J. H. Taylor, Chief Clerk, Merchandise Dept.*

## B. C. Electric Ry.—Victoria

Added load in 1939 in the lighting field was 340 kw., for an estimated annual revnue of $10,500. Quota for 1940 load is 300 kw. with an estimated revenue of $11,500. At Victoria the company has four domestic salesmen, and one lighting salesman. Coal and oil are major competing fuels. Business conditions were fair in 1939.

We made a change in residential schedules of rates effective in Victoria Oct. 15, 1939, and in the suburban areas on Dec. 1. The first block, on a floor area basis, was reduced from 6c to 5½c in the city, and from 8c to 7½c in suburban areas; the second step remained at 2c for the next 200 kw.-hr.; in the city a third step of 1c was made.—*E. N. Horsey, Light & Power Sales Manager.*

# Hawaii

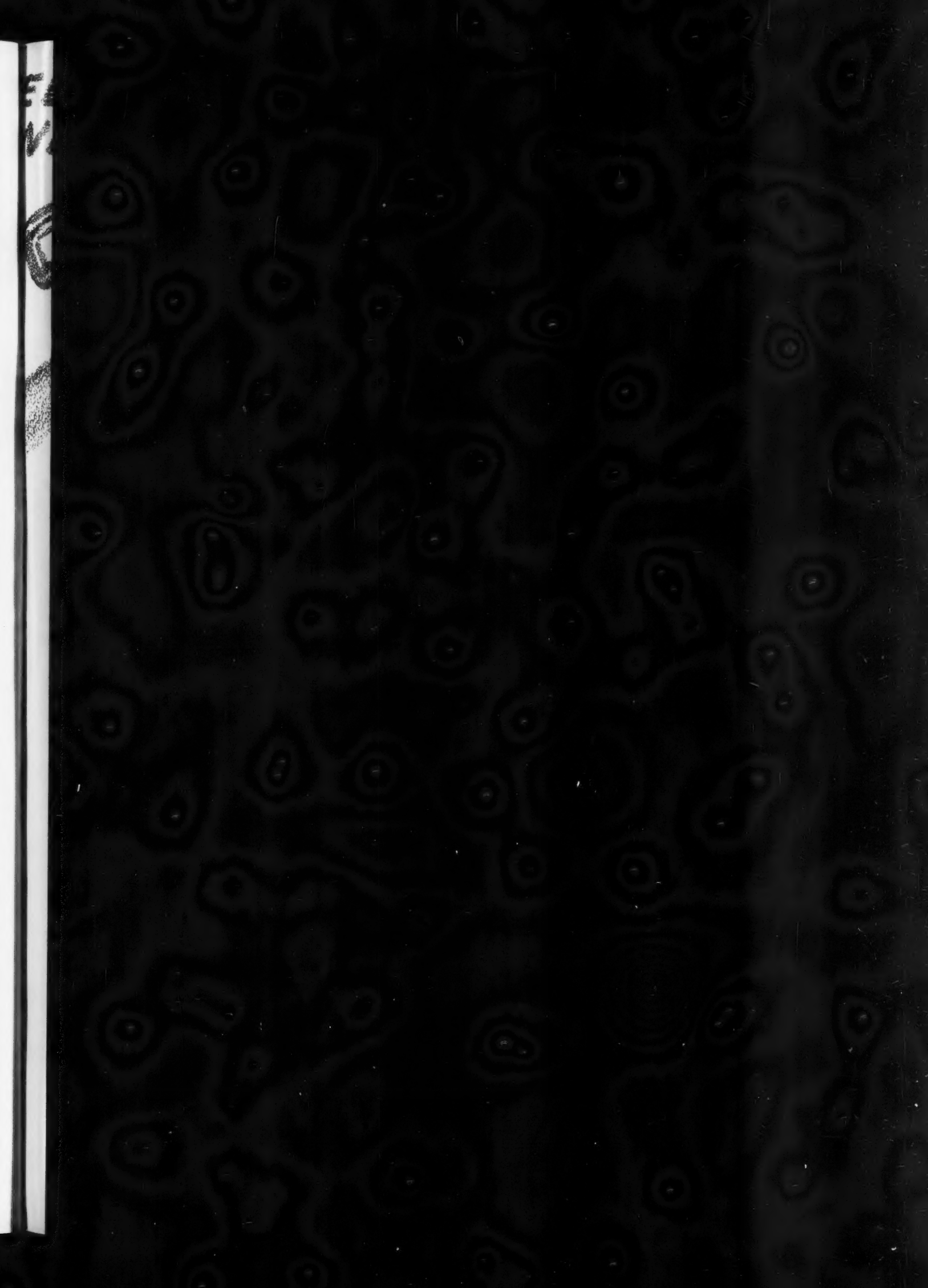
## Hawaiian Electric Co.

Electric consumers of Hawaii will receive savings in 1940 as the result of a new range and water heater program. The new year started the company's seventh rate cut in 12 years. The new rate reduced the residential rate an average of 10% or approximately $164,000. Commercial customers also will be affected by the new rate with reductions varying from 7% to 9½% according to the schedule. Total reductions for all classes of consumers amounts to approximately $300,000.

The new range and water heater program also provides free inside house wiring for all new electric ranges installed on company lines and free installation of all electric water heaters as well.

An employee bonus campaign is being conducted in which bonuses of $5 are given for names of prospects which are later sold, either range, water heater, refrigerator or dish washer. Similar bonuses are given on washers, ironers, vacuum cleaners, small appliances, lamps and shades.

A home lighting advisory service is offered customers.—*C. E. Nolan, Sales Manager.*



PRINT IN BINDING

ELECTRICAL WEST

# SALES GUIDE

**First of a new series — in which the ways to reopen sales that have become blocked or diverted will be treated—ways that are practical and sensible, gleaned from the experience of many successful practicing salesmen.**

# "Sell the DIFFERENCE"

There's a difference between the ordinary $2.50 hat and a Stetson or Knox. Salesmen every day are selling the better hat at prices that start twice as high. Same is true of automobiles and other articles.

Water may be water, and heat may be heat, but there **is** a difference between ordinary fuels and electricity—and of course you can sell it. The difference in cost is so small that the difference in value, in safety and peace of mind and luxury are not hard to sell. (See inside for a quick list and definite ideas "how".)

There's a difference to **you** too as dealer or salesman when you display, advertise and sell electric water heaters. For instance:

1. **More of the profit stays with you—**
2. **There's practically never any service cost—**
3. **Water heaters are natural follow-up for ranges you have sold.**
4. **Nothing you sell gives such complete satisfaction and stays sold better.**
5. **This satisfaction makes you "solid" with the customer for future appliance business.**
6. **It rounds out your volume—and compensation. Water heaters are a year 'round item.**
7. **The sale is substantial enough to warrant any extra effort necessary.**

The first million electric water heaters have been sold. That begins to spell "ACCEPTANCE." And the market is still the least saturated of any. Rates were never so low or so favorable.

"HERE'S HOW I'D GO AFTER THAT ELECTRIC WATER HEATER DOUGH..."

**As Donald Duck says, "It's duck soup."**

(Modern Kitchen Bureau material you can use features Donald Duck)

WATER HEATERS

FEBRUARY 1940

Copyright 1940 by Electrical West, 68 Post St., San Francisco. All rights reserved including permission to reprint in whole or in part

# OH, BY THE WAY—

## sale re-openers for when—

## 1. She must talk to her husband first.

## 2. She has other purchases in mind.

**1.** When you've put on your sales presentation to a prospect and then discover that he or she has to talk to someone else about it, husband or wife—

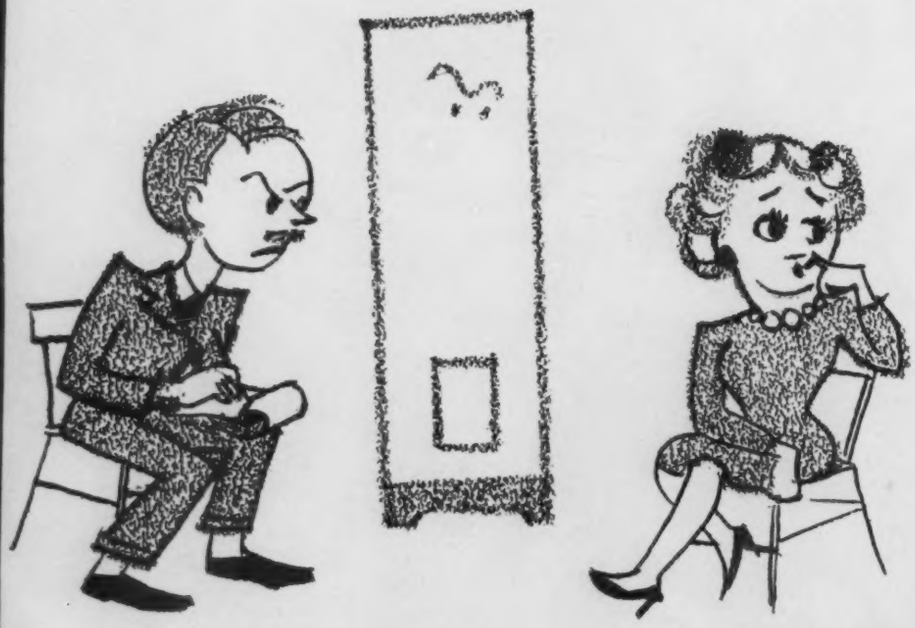
It happens in a large number of cases, especially when it comes to a major expenditure for a major appliance like the water heater. It is hard to prevent it happening, in fact, if you are on a cold canvass or if the prospect comes to the store before you have had a chance to arrange a joint interview with both husband and wife.

Don't let it get you down. Instead, say—

"Oh, by the way, there are some features of this water heater that will especially appeal to your husband (or wife). Shall we arrange a time right now for me to present this entire matter to you both together?" But don't leave it indefinite. Set a time. If it isn't the best one for them they will say so, but suggesting it helps bring a definite decision—

"Would tomorrow evening be convenient?"

In preparation for that "second performance" check over the list on the last page of this Guide. Check the points you have already made to the prospect. Be sure to repeat them for the husband or wife, and



SUGGESTED BY

use the others too. Pile up a good case for the electric water heater. You can **sell the difference** if you do.

**2.** Most every prospect wants a lot of other things. It may be clothes, a car, a trip, furniture, anything. You've always had that competition whether anything was ever said about it out loud or not.

In some cases the prospect secretly wants some more personal items — clothes, for instance, that seem so important to her. In other cases it may be fear to tie down to a contract to buy an electric water heater because of uncertainty of the future.

Don't be downhearted. It's a ghost that haunts every sale. Instead, say—

"If you don't mind telling me, was there something else you were considering buying first?"

Of course, that's a direct question, but if asked politely, should not offend, and it may smoke out just what your competition is. It may take a question or two more.

If you learn what it is, sympathize with that wish. Say you can understand how it would be very important. Then go on to say—

And here bring in a pleasure from the use of hot water instantly available, a service it performs, a value it has to her or the family that is a strong counter-balance to what she expects from the other thing she has in mind. It may be a new point you forgot to mention before, or a new way to put a point you have already made, to re-emphasize its importance to **her.**

Follow with more of the advantages of electric water heating service (on the next page) to make your appeal even stronger than that of the competition. Make the scale tip in your direction.


YOUR SALES ALLIES

**PUGET SOUND POWER & LIGHT CO. • WASHINGTON WATER POWER CO. • PORTLAND GENERAL ELECTRIC CO. CALIFORNIA OREGON POWER CO. • UTAH POWER & LIGHT CO. • IDAHO POWER CO. • THE MONTANA POWER CO. ROCKY MOUNTAIN ELECTRICAL LEAGUE**

HERE'S AN IDEA

# TALK THE "PLUS" VALUES

**These are the advantages of hot water service**

**Healthful** — plenty of hot water makes it so easy to bathe often, wash and sterilize clothes, dishes, clean house. In time of sickness it is indispensable.

**Clean** — electric water heating itself produces no soot or dirt. It is as clean as electric light, and the heater itself as easy to keep clean.

**Luxury**—from the very abundance of hot water comes a wonderful sense of luxury. Baths as often as wished, hot water for care of the complexion, for washing hair or lingerie.

**Automatic**—no more traipsing up or down stairs to turn it on or off or to check up. No more tank patting or waiting. Turn the faucet and hot water comes immediately.

**Convenient** — hot water when you want it, day or night, hot or cold weather, and as much as you want, when you want it.

**Increased home value**—electric water heating, under perfect temperature control, gives longer life to the tank and heater. Home will have a higher resale value thus equipped. Insurance risk is reduced. Hot water helps to maintain other home equipment more readily.

WHAT? NO FLAME?
AND NO FUMES! ELECTRIC WATER HEATING IS CLEAN, SAFE, CAREFREE — JUST LIKE ELECTRIC LIGHT!
ASK YOUR ELECTRIC COMPANY OR DEALER ABOUT LOW ELECTRIC WATER HEATING RATES
FREE DONALD DUCK'S JINGLE BOOK ON ELECTRIC WATER HEATERS
SEE YOUR DEALER OR WRITE TO DEPT. F
THE MODERN KITCHEN BUREAU
420 Lexington Ave., New York, N. Y.

**Here are electricity's special DIFFERENCES—**

**Peace of mind** — install it most anywhere, and then you can forget it. Whether anyone is home or not, never a care or worry over it. Nothing to turn off, to have to remember, to think about.

**Safety** — flameless and fumeless, it is safe if babies play around it. If space is scarce it can be installed in a closet or closed space and forgotten. It needs no flue or air supply. Failure of water or of fuel do not bring danger. No pilot to go out.

**Dependable**—accurate thermostats keep the water at exactly the right temperature. Control is accurate and trouble-free.

**Efficient** — economical because every bit of electricity goes into heating the water, not up the stack. So well insulated that heat stays in the tank and water, instead of spreading into the room. Immersed in water the electric element gives all of its heat to the water.

**Most modern** — tomorrow's way today. Most modern in styling. Fits right into the streamlined modern kitchen anywhere. Future fuel supply is the most assured of all.

Modern Kitchen Bureau makes you still more chances to profit by offering prizes for: 1. Newspaper advertising, 2. Window display, 3. Retail salesmen. 4. Best utility job. Details are available for the asking from 420 Lexington Ave., New York. Ads like that shown at right will appear in national magazines. Fasten onto them too.

YOU MIGHT TRY

# Leagues

## Electrical Appliance Society of Northern California

Six years of successful cooperative advertising campaigns have served to establish the Electric Appliance Society of Northern California as one of the nation's most outstanding promotional organizations of this kind. Since its founding in 1933, the Society has proven itself to be a definite and valuable builder of retail sales and a logical medium for the dissemination, among dealers, of modern merchandising methods.

The year 1939 included two successful campaigns—one on refrigerators, the other on electrical Christmas gifts—and the inauguration of a trial merchandising plan for electric ironers. The latter came as a result of the San Jose Test Plan of the previous year, set up on a modified basis to utilize the pertinent features of the San Jose Plan, including instruction in the home.

This trial merchandising plan was adopted Feb. 15 by all major distributors. Its inauguration was supported by two utility ads throughout Northern California run over the signature of the Electric Appliance Society. The Society itslef supplied dealer display cards, mimeographed publicity, demonstration record cards, and free mats for dealer advertising. While the program was discontinued as an industry-wide promotion after a two month's trial, its principles have been adopted by many of the manufacturers individually and its beneficial effect on selling operations is reflected in 1939 ironer sales figures which show an increase for the first time in many years.

The refrigerator campaign, held April 10 to May 6, again utilized the slogan "It Pays for Itself"—a slogan which was developed by the Society and which has become practically synonymous with electric refrigerators. Incidentally, this slogan has since been copied by advertisers in all parts of the country. The food savings story was again stressed in the campaign in display cards, radio announcements, and the free publicity and advertising mat service, etc. Cash prizes totalling $240 for the best window displays caused a very gratifying response, nearly 50 entries being received.

Advertising in support of the campaign, furnished by the Pacific Gas and Electric Co., and again carrying the signature of the Electric Appliance Society, included a series of three advertisements in approximately 250 newspapers. The utility further cooperated by providing stickers on all of its electric bills, and by arranging for cooperative displays of electric refrigerators in 68 of its offices.

Evidence that the "Pays for Itself" story is bringing results throughout the entire year is shown in both unit sales and advertiisng figures. Sales for 1939 showed an increase of 16% over 1938, and were spread more uniformly over the entire twelve months period. Total dealer supporting advertising in 1939 amounted to $143,432, an increase of $20,662 over 1938.

With the slogan "Smart Giving", the Society sponsored the campaign on electrical Christmas gifts from December 4 to 23. Campaign features included approximately 350 spot announcements on 13 key radio stations; display cards, counter cards and wreaths to tie to appliances; a publicity and free mat service and a window display contest. The Pacific Gas and Electric Co. again supported this campaign with a full coverage of newspaper advertising and with colorful stickers on approximately 350,000 of its monthly bills.

The Sales Training Program that was organized by the Society in 1938 in connection with the George-Deen Act, was continued with two series of five classes each. One hundred and ninety-eight retail appliance salesmen, from 24 communities, availed themselves of the opportunity to attend these sales conferences. Their interest was evidenced by the enthusiasm they displayed and the high attendance record that resulted.

The Society's program for 1940, which will soon be announced, is expected to be more comprehensive than last year's. A refrigerator campaign, which will launch the program, has been entatively set for April 8 to May 4. An electrical Christmas gifts campaign will probably be held in December. and plans are being discussed for a home laundry campaign in the late summer or early fall.—*O. E. Rush, Asst. Promotional Director.*

**An inexpensive window trim service was supplied to dealers by the Electrical Appliance Society of Northern California at small cost during the Christmas season. Here is how it was used by Radio Electric Shop of Sonoma, Calif. This display service may be extended through the year**

## Pacific Coast Electrical Bureau Northern Division

Lighting and wiring modernization, school lighting, Red Seal adequate wiring, outdoor Christmas lighting, Better Light-Better Sight, and an educational program were set up by the Advisory Committee as the program for the Bureau for 1939.

One of the major activities during the year has been lighting and wiring modernization of office and commercial buildings. A survey of the financial district of San Francisco alone indicated possibilities in this field in excess of $1,500,000, individual jobs running from $1,000 to $100,000. For the first period of operation, it has been necessary to confine effort to the San Francisco bay metropolitan area but ultimately it is intended to extend the field to cover all northern California. Because of unwillingness to accept the causes for building unoccupancy and re-

sentment of some managements at having these pointed out to them, it was necessary to compile extensive data from which to work. This involved extensive research. These data have already been of considerable assistance and will be of recurring value.

To carry the message of better light and better lighting, appearances have been made before 27 organizations with a total attendance of 4,494. In addition, the Bureau has conducted five classroom courses from three to six lessons each for the printing, electrical workers, electrical contractors, electrical apprentices, and painters crafts in San Francisco and the East Bay. Total attendance at these classes has been 1,777 and a waiting list for class instruction of over 600 has developed among the electrical unions at Richmond, Oakland, San Jose, and the cabinet manufacturers, architects and painters' apprentices of the San Francisco and East Bay.

#### Outdoor Christmas Lighting

The Bureau has directly sponsored the outdoor Christmas lighting activity in cooperation with the Outdoor Christmas Tree Association of California. Arrangements were made with Jean Scott Frickelton to handle the details. Mrs. Alma DeBretteville Spreckels Awl accepted the state presidency of the Association and surrounded herself with an extensive directorship of prominent, wealthy and influential persons. Numerous meetings of various committees were held under the general chairmanship of A. E. Rowe.

Red Seal adequate wiring activity has been carried on principally by division sales representatives of the Pacific Gas and Electric Co. supervised by J. R. Lazarus, regional manager, Pacific Coast Electrical Assn.

#### Adequate Wiring Conference

Late in July the Bureau was requested by the National Adequate Wiring Bureau to make all arrangements for the first regional adequate wiring conference ever held. Attendance at this conference was 110 persons from eleven states and two nations. It also handled much of the detail in connection with All Electrical Industry day at the Fair on Sept. 16. The Bureau also has been active in so many of the details in connection with industry promotions that it would be difficult to list them all. Its program for 1940 is materially the same as that for 1939 with a somewhat augmented budget. For the first year of its operation under its reorganized form, beginning late in May, it is felt that the record of accomplishment is sufficient to justify the support of all branches of the industry in a far more intensive manner during 1940.—*George W. Barker, Manager.*

## Electrical Development League of Southern California

In their monthly bulletin, *Newsflashes*, the Electrical League of Southern California looks back on its work during 1939. And a complete program it was, too, stretching from Adequate Wiring Promotion to the sensational "Matchless" electric home to the activities of the Electrical Maintenance Engineers Assn., started by the League four years ago with 12 members enrolled. Today membership is 410.

On adequate wiring promotion, architects, building contractors, electric contractors, the electric industry and the general public were covered. Educational and promotional meetings, direct mail and personal contact and services, served to tell adequately the story of adequate wiring.

Forty-seven meetings with all types of groups were held with the public. Two radio broadcasts were given together with newspaper and magazine advertisign. Displays and publicity releases furthered the cause still more.

Codes, ordinances and rewiring were developed and simplified among southern California communities so that they will be more understandable to all parties concerned. A speakers bureau was maintained, and an educational program carried on in Los Angeles Junior College and UCLA.

More than 100,000 people visited the "Matchless" electric home since May, 1939, resulting in hundreds of real prospects and many sales. Beyond this, activity in the Electrical Maintenance Engineers Assn. was an important phase of the League's work. The association meets every 3d Tuesday of the month, with attendance ranging from 125 to 225.

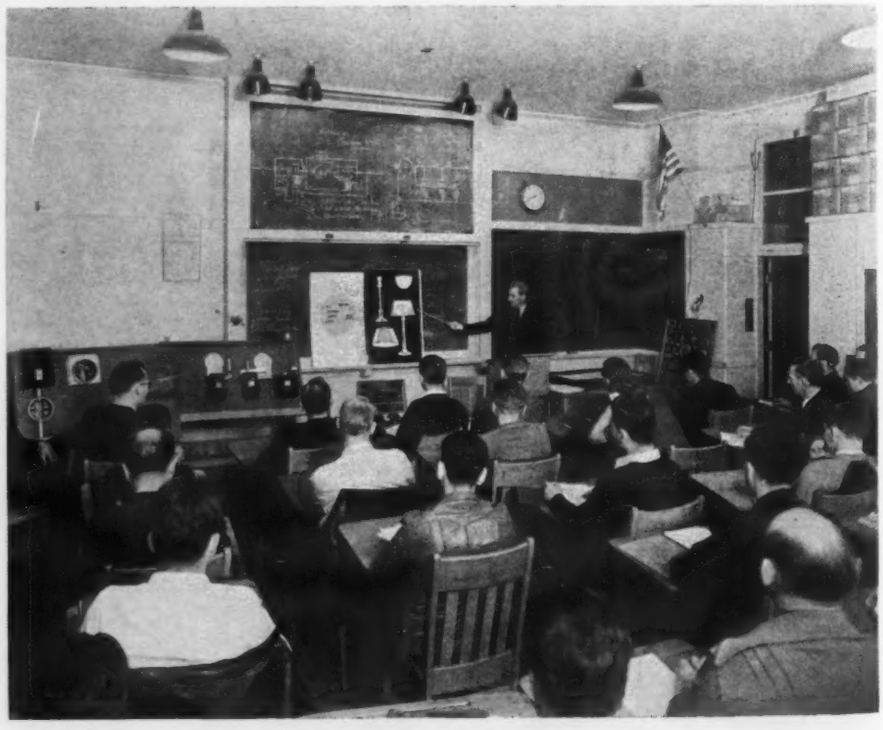
The League has also worked closely with the Modern Kitchen Bureau. tying in with their national advertising, using it with the League's local copy on the use of the electric range, water heater and refrigerator. Through the Producers' Council, the electrical industry, via the League, presents a program to architects. More than 325 architects attended the League's electrical program held last March.

Through the auspices of the League, three meetings on the new Los Angeles electrical code were held in November. An overflow crowd of journeymen. inspectors, contractors attended each meeting.

## Bureau of Radio & Elect. Appliances of San Diego County

During 1939, every manufacturer, distributor and dealer doing business in San Diego County shared in the sales development campaigns and programs sponsored by the Bureau. Since 1933, the Bureau has been stimulating the sale and use of electrical appliances and services.

The Log for 1939 shows that in January a portable electric heater cam-



Apprentices of electrical and other crafts are taught the fundamentals of good lighting by Clark Baker, lighting counselor for the Pacific Coast Electrical Bureau. This is one such class at Samuel Gompers trade school in San Francisco. Other classes are held in Oakland, and in 1940, the Bureau's program calls for more sessions to be held in other Bay region cities

paign was run in city and county newspapers, while in February, table appliances ads in local papers were used. A Television Committee continued its good work of helping to bury unfavorable television stories. In March, a washer and ironer campaign featured insertion of nine 80″ advertisements.

The Third Annual Spring Fair was held from April 25-30, emphasizing home modernization. More than 65,000 attended and bought heavily during the show. Refrigeration advertising was begun in May and a Refrigeration Discussion Forum was held May 25th.

Refrigeration advertising was continued throughout June with copy that really clicked. A Trade Practice Committee adopted a constructive and workable plan and it was put into operation at once.

**Radio Program**

A radio program called "Leisure House" was aired three times a week over KGB during July. Refrigeration advertising was continued, and electric cookery promoted in county publications. A refrigeration recipe book, "Under 50 Fancies," was issued by the League and backed by daily newspapers and radio. Twenty-thousand copies of this booklet were distributed, so popular were these recipes.

The famous "Two Radios for the Price of One" campaign was revived during August and was launched with heavy copy in 12 separate ads. This was carried through October with considerable success. Forty-thousand of these Logs were printed and distributed.

Seventh Annual Electrical show in December drew 110,000 people. Feature exhibits were splendid, and more buying interest than ever before was created. All San Diego records were broken in Christmas buying of things electrical. Six-sheet posters were put up and special publicity material was used to run in holiday sections of newspapers.

With the retail value of all appliances sold in San Diego County in 1939 set at $3,500,000, aggressive plans and programs are under way for 1940 sponsored by the Bureau.—*J. Clarke Chamberlain.*

## Electrical League of Utah

The Electrical League of Utah, reorganized in May, 1938 after being dormant for a period of seven years, has clearly made its influence felt on the electrical industry of the Intermountain West in the short period since its reorganization. The various promotional activities and industry programs it has been fostering fill a long felt need, and the accomplishments of these activities are already producing gratifying results throughout the territory served by the League.

During 1939, fifty homes in its territory received Certificates of Adequate Wiring, and through Adequate Wiring promotional efforts, wiring capacity was increased greatly in more than 100 homes. Contacts were made with more than 550 new home builders during the year through various Adequate Wiring promotional media. With more than fifty homes now awaiting official approval, together with building in the territory expected to reach an all-time high, the Adequate Wiring activity will prove to be even greater in scope in 1940. Radio programs, which last year told the necessity of Adequate Wiring to listeners, will be continued with the story reaching prospective builders not being contacted through its other promotional efforts.

The approval of thin-wall insulation by Salt Lake City's Chief Wiring Inspector, Blaine Grey, will be the signal for the conducting of an activity to bring about modern, up-to-date lighting to many of Salt Lake City's outmoded office and industrial buildings and throws wipe open the enormous rewiring program.

Through the George-Deen Act, the League's Appliance Sales Training Course will be continued with additional classes being inaugurated in other cities. Appliance sales programs and the promotional material of the Modern Kitchen Bureau will be used to bring about greater appliance sales during 1940.

Being tentatively planned is an all-year appliance sales campaign which will get off to a good start with a Spring Electric Range Campaign to start about Feb. 25. The program will continue through the remaining months of the year and will be terminated by a vigorous "Give Electrical Gifts" Christmas appliance campaign in December, similar to the one completed in 1939.

A special program is being outlined by the Activity Committee for an appliance dealer coordination program through which dealers will be educated on selling, price control trade-ins, window and store arrangements, managements, etc.

Membership is on the increase and throughout the new year an untiring effort will be made by the Membership Committee to bring into the League-fold all businesses whose income is dependent upon the future growth in the use and acceptance of electricity.

Residential Christmas Lighting will be conducted on a similar basis as the program for 1939 when Salt Lake City won top honors for Christmas Lighting in the nation.

## Electrical Service League of B. C.

Marked progress was made during 1939 by the Electrical Service League of British Columbia, according to the report recently presented to the directors by R. Hall, secretary-manager of the League at Vancouver. The work of the League was concentrated during the year in development of industrial co-operation; residential field work; promotion of commercial, industrial and residential lighting, and general educational work. These activities were financed by all branches of the industry.

In its adequate wiring campaign the major feature was the big demonstration at the Vancouver Exhibition, where a skeleton of a full size house was erected and fully wired in the most modern style.

The Home Appliance Council organized under the auspices of the League co-ordinated merchandising efforts of manufacturers and distributors of appliances, and sponsored several special co-operative merchandising drives, lighting, radios and ranges being especially covered.

**Direct Mail Campaign**

Approximately $1000 was spent by the League in an educational direct mail campaign to promote commercial and industrial lighting and covering 30,000 prospects. Excellent results are reported. In the realm of general educational work the public has been kept posted on developments within the industry through the use of sound and silent motion pictures and slide films. Some 85 presentations were made during the year before over 10,000 persons, and it is believed this has proven a valuable means of advising the public of the benefits to be secured from complete electric service. J. Priestman, assistant manager of the League, has again supervised 14 cooking schools held in various centers during the year and attended by over 3000 persons.

Splendid results were accomplished by the Home Lighting Advisory Service. Merchandise to the value of $23,972.45 is known to have been sold as the result of the efforts of the staff of this department, the sales mainly comprising bulbs, portable lamps, fixtures and wiring materials. A total of 4.8 calls were made on the average in each of the 228 working days in the year, and the average recommended load per demonstration was 416.7 watts. The average installed load per call back works out at 270.9 watts. On these calls merchandise to the value of $36,507.12 was recommended for installation, which gives an average of $22.73 per demonstration. Call-backs proved that an average of $12.90 was purchased, or a total of $23,972.45.

# ELECTRICAL WEST

*The All-Industry Magazine of Progress*

Established 1887 and Incorporating the "Electrical Journal." "Journal of Electricity, Power & Gas" and "Journal of Electricity"

McGRAW-HILL COMPANY OF CALIFORNIA
68 Post Street, San Francisco


Contents Copyrighted


James H. McGraw, Chairman of the Board Howard Ehrlich, President
George C. Tenney, Vice-President and Editor
Wayne Snowden, Engineering Editor
R. A. Balzari, Publishing Counselor
Roy N. Phelan, Secretary-Treasurer & Manager
W. A. Cyr, Associate Editor
G. William Gahagan, Assistant Editor
Hans Hjorth, Typography

MEMBER AUDIT BUREAU OF CIRCULATIONS

ADVERTISING REPRESENTATIVES
Ralph H. Flynn, 330 W. 42nd St., New York
William B. Heaps, 520 N. Michigan Ave., Chicago
Roy N. Phelan, 68 Post St., San Francisco
Stephen H. Babcock, 2-144 General Motors Bldg., Detroit

EDITORIAL ADVISORY BOARD

UTILITIES: R. E. Fisher, Vice-President in Charge of Public Relations and Sales, Pacific Gas and Electric Company, San Francisco; J. A. Hale, Vice-President, Utah Power & Light Company, Salt Lake City; Glenn L. Jackson, Vice-President and Commercial Manager, The California Oregon Power Company, Medford; Frank McLaughlin, President, Puget Sound Power & Light Co., Seattle; L. T. Merwin, President, Northwestern Electric Company, Portland; W. C. Mullendore, Executive Vice-President, Southern California Edison Company, Ltd., Los Angeles . . . MANUFACTURERS: Vernon Brown, Vice-President, Square D Company, Los Angeles; W. R. Marshall, Vice-President, Westinghouse Electric & Mfg. Co., San Francisco; A. S. Moody, Northwest Manager, General Electric Company, Portland . . . WHOLESALERS: J. I. Colwell, Northwest Manager, Graybar Electric Co., Inc., Seattle; N. W. Graham, Graham-Reynolds Electric Co., Los Angeles . . . CONTRACTORS: Lloyd Flatland, Globe Electric Works, San Francisco; S. G. Hepler, Arrow Electric Co., Seattle . . . DEALERS: H. H. Courtright, President, Valley Electrical Supply Company, Fresno; J. C. Chamberlain, Sec'y-Mgr., Bureau of Radio and Electrical Appliances, San Diego.

## Appreciation and Dedication

IN WHATEVER branch of the industry you are, this twenty-first annual review of progress and opportunity prepared by ELECTRICAL WEST is aimed at making your job more profitable, more significant, more secure, more satisfactory to you. Rather than presenting it as a statistical handbook gathered from all available sources, the editors offer it as a review of accomplishments and a gage of the future. There are figures which prove that this electrical industry is set on the solid foundation of service performance. There are others which prove that its position is not static, that its growth is assured. Reports reveal engineering trends, indicate markets for manufacturers. Other reviews indicate sales efforts and sales programs to which dealers and distributors may tie their individual sales drives. And still others outline cooperative undertakings aimed at developing electrical markets.

The task of the editors was simple. It was merely one of assembly, editing and interpreting. Most of the information was contributed by hundreds of people in the utilities, the various associations and different branches of the industry. To this corps of voluntary helpers we express our sincere appreciation with the definite assurance that their help has made possible the compilation of this guidebook and analysis so that others may learn and profit. To everyone else who reads its pages we say that it presents proof of stability of jobs, outlines opportunities and delineates an industry that is vital, progressive and prosperous. There is significant value in all of its pages for everyone. Study them! Use them!

## Penalty For Leadership

IN SEARCHING for reasons why the electrical industry is attacked and vilified by bureaucrat and politician, a practical rather than a philosophical line of reasoning is usually undertaken. As a matter of fact the fundamental cause lies deeper than any mere surface indication which a practical examination might reveal. Here is an explanation from the pen of an anonymous writer:

"Whether leadership reside in a man, an industry or a manufactured product, emulation and envy are ever at work and in all worthy undertakings the reward and the penalty are ever the same. The reward is widespread recognition, the penalty belittlement. When an industry's work becomes a standard for the whole world, it also becomes the target for displacement. If its work be mediocre, it will be left severely alone. There is nothing new in this—it is as old as the world and as ancient as human nature itself. If ever an industry truly leads, it remains—the pattern."

Thus along with the exasperation, the vexation and the worriment that accompanies the constant attacks, there should go a full measure of pride. Pride in an industry whose accomplishments are so great and so worthy that its leadership incites the envy and the jealousy of the demagogue and the bigot.

## Tax Tangles

IF AN IRONICAL smile flits across the countenance of the utility people who read the following, it is because they will be prompted to say, "I told you so." Here is a resolution passed by the promoters of the Umatilla Electric Cooperative—an Oregon REA project:

"The REA has been created to supply electricity to rural communities and districts not already supplied, and their services are limited to such districts; communities thickly settled and favorably located for electric service for the most part have been already supplied . . . by private companies, leaving the less favorably located districts for REA service; competition with such companies is forbidden, and under such restric-

tions and regulations, the cost of lines and equipment is exceptionally high, and the present method of taxing on a valuation determined by cost of construction is practically confiscatory."

So the Umatilla REA wants relief in the form of a three-year tax moratorium. Unless some relief is forthcoming, future operation of the cooperative is threatened, the promoters say.

Here is a new angle to the tax tangles which have followed the launching of government power enterprise. In the TVA territory counties, school districts and states set up a hue and cry over lost tax revenues when privately-owned utility properties went over to government ownership. Now a government agency on which a limited tax load is imposed by law, seeks to get out from under on the grounds that the burden is unjust, unbearable and "practically confiscatory."

In their promises of low rates, the proponents of public power take for granted that some of the savings will come from tax exemption. And the public harkens to their siren call until either the loss of tax revenues, or as in the case of the Umatilla cooperative, the tax burden brings a rude awakening. Until some such crisis develops, everyone seems to ignore the fact that the power companies turn back to government from 15 to 22 cents of every dollar they collect from the ratepayer.

Tax crises such as these have a salutary effect. The more that develop the quicker the public will turn a deaf ear on the proposals of the public ownership proponent.

## *Industry Relations*

COMPLEXITIES, increasing size, faster tempo and greater demands on time are militating against the close personal relationships that carried through all branches of the electrical industry just a few years ago. And the absence of the human relationships are in no small measure responsible for the disharmony, misunderstandings and misalignments that seemingly crop up with increasing regularity. This is not to say that industry unity has completely vanished. But it is certain that the solidarity that is so essential to the unified progress of all branches is lacking to a greater degree than ever before.

A truth of vital significance is that good industrial relations are as essential as good public relations. In fact the latter are impossible without the former. This is particularly true in an industry as large and as close to the public as the electrical business with its many ramifications.

In an intimate discussion of these problems just recently a possible solution was offered by a man who has spent more than 40 of his active years in different branches of the industry. He proffered this suggestion:

"After all is said and done the one agency primarily concerned with the maintenance of satisfactory industry relations is the power company. Their interests are likely to be affected most by the actions of any of the other branches. So why should not the power companies create a position which might be called 'manager of industry relations?' Select for that job a man pre-eminent in human understanding and give him responsibility to speak with authority for the utility in all of its dealings with the other branches. The right man would work wonders in creating and maintaining satisfactory industry relations."

While this would not replace the oldtime close personal relationships that did so much to knit the industry into a harmonious unit, it would certainly forestall many of the current misunderstandings. The job would be no sinecure. But the possibilities for worthwhile accomplishment would be immeasurable.

## *Morality and Prices*

THROWN into focus by the present wave of building industry investigations is the age-old problem of price-fixing. The time is here to look at it analytically rather than to jump at conclusions of its relative morality or immorality.

Price-fixing alone was not the reason for the original passage of the Sherman anti-trust act; fear that unregulated monopolies would result in public extortion was primarily responsible for this legislation. Indeed where the public recognized the need for natural monopolies, such as public utilities, it required price-fixing under public regulation.

Further recognition of such a need was back of NRA, welcomed by depressed business which had almost been bankrupted by ruinous price-cutting. What killed NRA was not that it is morally wrong to permit business to regulate itself by codes, but that the legislation permitted the extension of federal power over local business.

There is plenty of evidence to prove that the public philosophy is not contrary to price regulation within reason. Trade practice acts are in effect in 43 of the 48 states. These repudiate in theory both the Sherman and Clayton acts and support the basic idea of industry self-regulation. The Miller-Tydings act further enables states to uphold such a practice even in the case of interstate commerce.

Business and the public need to review this entire problem in the light of present-day conditions and public interest. Congress should be told that this latest witch hunt is killing the building market and frightening all business once more with the threat of federal domination.

# Utah League

## Hyde elected head of electrical group in Salt Lake City

Orson John Hyde, Salt Lake district manager for the Mountain States Telephone and Telegraph Co., was elected president of the Electrical League of Utah, Jan. 10 at an annual meeting. Hyde, who was League vice-president during 1939, succeeds J. Vernon Sharp, manager of the Sharp Electric Co.

Other officers elected were G. Wayne Stillman, of Radio Studios, Inc., vice-president; Fred Schoss of the Schoss-Read Electric Co., Ogden, vice-president, and Edward J. Duggan of the Westinghouse Electric Supply Co., secretary-treasurer.

Elias J. Strong, League manager, was reappointed, and the following Board of Trustees elected: Paul J. Devine, W. H. Bintz Co.; E. J. Duggan, Westinghouse Supply; W. J. Berryman, Mine & Smelter Supply Co.; W. E. Gnadt, The Salt Lake Hardware Co.; representing wholesalers. M. E. Dansie, Vance Electric Co.; G. W. Forsberg, Wasatch Electric Co.; J. Vernon Sharp, Sharp Electric Co.; M. A. Strand, Strand Electric Co.; representing contractors. L. E. Brown, Westinghouse Electric & Mfg. Co.; G. H. Waite, American Steel & Wire Co.; B. C. J. Wheatlake, General Electric Co.; Chas. F. Wiggs, Chicago Flexible Shaft Co.; representing manufacturers.

Representing dealers will be J. E. Gillespie, Sears, Roebuck & Co.; C. W. Gilner, Gilner Electric Co.; Robert Nevins, The Paris Co.; and G. Wayne Stillman, Radio Studios, Inc. Representing utilities: Ora H. Barlow and Orson John Hyde of the Mountain States Telephone & Telegraph Co., and W. A. Huckins and C. A. Wolfrom of the Utah Power and Light Co.

# Inspectors

## IAEI Rocky Mountain chapter name Herold new club president

At conclusion of the sixth annual inspectors' school, Jan. 15-16, members of the Rocky Mountain chapter, International Assn. of Electrical Inspectors, named William Herold of Fort Morgan, Colo., president, to succeed William H. Hart, Pueblo, Colo., who was elected a member of the executive committee.

V. C. Moulton, Denver, was elected secretary-treasurer, succeeding himself. George R. Hubbard, Boulder, Colo., was elected first vice-chairman, and

HYDE

M. M. Wilson, Rapid City, South Dakota, second vice-chairman. The resignation of L. A. Barley, Denver, from the executive committee created a vacancy which was filled by G. F. Wallis, La Junta, Colo.

A distinguished gathering of contractors, utility officials, engineers, wiremen, city managers and other persons connected with the electrical industry assembled in Denver for the two-day session.

National president, James B. Galbraith, Detroit, addressed the group on the opening day of the meeting. Highlight of the second day's activities was a joint luncheon in which the Colorado Municipal League and Rocky Mountain Electrical League participated. Guest speakers were Ralph Johnson, Denver, and Don C. Sowers, Boulder, Colo.

# New Officers

The Producers' Council Club of Southern California held its annual installation of officers and Christmas hijinks Dec. 18, 1939, in Los Angeles. The program was under the direction of F. L. Hockensmith, secretary to the Electrical Development League of Southern California, who produced one of the most outstanding programs of the year.

Officers of the Producers' Council Club for 1940 are: president, Curtis B. Sauer, Armstrong Cork Co.; vice-president, Walter R. Steyer, H. H. Robertson Co.; secretary, J. M. LaMontagne, Westinghouse Electric & Mfg. Co.; treasurer, J. H. Soldini, John-Manville Co.

More than 300 Southern California architects were present to see Charles J. McIver of the Crane Co., retiring president of the club, receive a radio from the club as a gift for his fine work during the year of 1939.

# Agenda

## Western Leagues and clubs begin programs for 1940

Electrical associations along the Pacific Coast have swung right into action for the new year. Whether pertaining to sales or highly technical subjects, these gatherings are for the good of the electrical industry and individually benefit all concerned.

American Institute of Electrical Engineers, San Francisco Section — Technical meeting held Jan. 12. Informal dinner followed by talk by S. J. Lisberger, chief of division of electric distribution, Dept. of Engineering, PG and E. His subject: Substation Design and Its Relation to the Distribution System.

Seattle Section—Met Jan. 16 at Guggenheim Hall, Univ. of Washington campus, to hear J. F. Spease, Northwest district engineer, General Electric Co. His subject: Electrical and Mechanical Features of the Trolley Coach. Arthur I. Launder is secretary-treasurer.

Vancouver Section—Meeting held Jan. 8 at Medical Dental Auditorium. Speaker was S. C. Morgan, who discussed Photometric Concepts. Morgan is an associate professor of electrical engineering at the Univ. of British Columbia.

Air Conditioning Society—Regular meeting held Jan. 4, when Phil Dickinson, Bureau of Reclamation, spoke on the Shasta Dam and the Central Valley Project. R. B. Holland is president of the Society.

Electrical Estimators, Los Angeles — First meeting of new year held Jan. 4 in Chamber of Commerce. Speaker was Jim Setchell, Trumbull Electric, who spoke on Salesmanship, a Gift or a Science. Wm. Shack is president of the club; Art Rowley, vice-president; Fred Ulbrick, treasurer and John Strickley, secretary.

Electric Club of San Diego—Met Jan. 2 to see sound picture Science of Seeing. Carlton M. "Tommy" Thompson was chairman of day. Jan. 9 meeting featured by talk given by Frank G. Forward, president San Diego Chamber of Commerce. What is Ahead in 1940 was Forward's subject. Chairman of this event was F. L. "Barney" Barnhill.

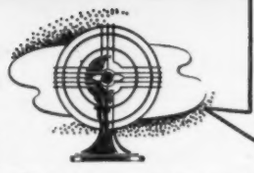
Electric Club of Washington—Ira W. Bedle, vice-president National Bank of Commerce, Seattle, showed movies at Jan. 8 meeting of his tour of eleven European countries. On Jan. 15, Professor Frederich K. Kirsten, Dept. of Aeronautical Engineering, Univ. of Washington, spoke on European Conflict from a Scientific and Engineering Standpoint.

Illuminating Engineering Society, Southern California Section—Direct or Indirect Lighting was debated Jan. 9 by Roy Baum, Illumination Section, Dept. of Water & Power, who represented Direct Lighting, and Trent German, Southern California Edison Co., who championed Indirect Lighting.

Pot & Kettle Club—Harry C. Gleason, Seattle, chairman, national convention committee of the Associated Pot & Kettle Clubs of America, has set June 28-29 for the annual convention to be held this year at the Lake Crescent Tavern, Port Angeles, Washington.

International Assn. of Electrical Inspectors, southwestern section-Northern California chapter held its regular quarterly meeting in San Francisco, Jan. 31. Ralph W. Wiley, chief of the Dept. of Electricity of San Francisco, and George Kimball, electrical engineer of the State Industrial Accident Commission, discussed the National Electric Code.

**THAT'S THE G-E FAN STORY FOR 1940**



IT'S a simple story too—a fine, dependable product backed by a name respected by both dealer and user.

And when you have that combination it's easily translated into profits.

Put yourself in line for these profits. Get the full story from your nearest G-E Fan distributor—but get it fast if you want to be in on the 1940 program.

And here's a good tip—make certain your distributor's salesman takes the wraps off the G-E 1940 Fan Portfolio the very next time you see him. We've called it "A Sweet Set-up!" . . . . . and it is!

And there's a plus you can't ignore—the dominant, colorful, National magazine advertising which month in and month out helps maintain user acceptance and keep the G-E name constantly in the limelight!

**Help yourself to sales with this powerful promotion! Free with your initial G-E Fan order.**

1. A full-color "stopper" display designed to catch the eye—and hold it!
2. Smart catalogs full of selling facts!
3. Direct-mail pieces to help build your volume!
4. Convincing ready-made newspaper mats for local use!
5. Powerful national newspaper ads in over 175 key cities—run at the best time to sell fans—in local hot weather!

*G-E Fans are Going Places — Doing Things in 1940!*

**Fan Sales Section, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.**

**GENERAL ELECTRIC**

# New Association

## Puget Sound Utility association to study acquisition of utilities

A new branch of the Washington Board Utility Commissioners Association, to be known as the Puget Sound Utility Commissioners Assn. has been formed, composed of representatives of counties now served by the private utility company, has been formed. The association has voted to enter into negotiations for acquisition of the private power company's properties, with the view to acquiring it all at once, voting, however, also to continue to press condemnation proceedings.

The following officers were elected: A. G. Ziebell, Snohomish County, president; Martin Jacobsen, Lewis County, vice-president, and George Marshall, Thurston, secretary. The counties involved are Thurston, Chelan, Douglas, Skagit, Whatcom, Snohomish, Cowlitz, Lewis, Pacific and Grays Harbor.

The Washington Board Utility Commissioners has gone on record as opposing initiative No. 139, recently filed with the secretary of state, which would require a 40% vote on any revenue bonds to be issued by public utility districts. The district power bill was passed as an initiative in 1930, authorizing establishment of utility districts.

A recent Supreme Court decision held the commissioners of each district have the authority to acquire utility property and to issue utility bonds in payment thereof without an election. PUD commissioners declare that passage of No. 139 would "hamstring efforts of utility districts to continue development of public power facilities."

# Future Meeting

## Annual Business Development session to be held this month

Annual Business Development meeting of the Northwest Electric Light & Power Assn. will be held at the Olympic Hotel, Seattle, Feb. 29 and Mar. 1, according to C. Patrick Johnson, section chairman.

The meeting will consist of three one-half-day general sessions, taking up all aspects of sales work and business development, and one half-day session devoted to concurrent bureau and committee conferences. The bureaus which will meet separately in these conferences, with their chairmen are: Commercial & Industrial Sales, J. A. Lockhart, Pacific Power & Light Co.; Residential Sales, J. F. McAllister, Utah Power & Light Co.; Rural Sales, J. C. Scott, Puget Sound Power & Light Co.; and Advertising, John Dierdorff, Northwestern Electric Co. Several speakers prominent in the industry nationally are being invited to appear on the program of the general sessions. At the last general session, brief summary reports will be heard from the bureaus and committees.

# Convention

## PCEA 1940 gathering to be held in Oakland May 22-24

Hotel Oakland, Oakland, Calif., will be the scene of the 1940 PCEA convention according to president W. W. Glosser. Dates will be May 22-23-24. Because of the success of last year's convention in combining the annual convention with the Spring conclave, this practice will again be followed. One day will be devoted to parallel sessions of the sections and committees. There will be three general sessions and one afternoon will be devoted to the annual golf tournament.

Harold Q. Noack, Pacific division sales manager, Hubbard & Co., has been named general convention chairman. Other committee appointments will be made within the next few weeks.

## Wholesalers To Meet

Pacific Coast wholesalers will hold their annual meeting at Hotel Del Monte Feb. 15-16-17 according to F. C. Todt, Pacific division chairman, NEWA. This is the meeting at which utilities present their reports on the business outlook for the coming year and P. C. Carson, program committee chairman, has stated that two open meetings will be held, on the mornings of Feb. 16-17. A number of speakers have been secured to present material of vital intent to all branches of the electrical industry.

● C. E. WEBB has been elected chairman of the Vancouver branch, Engineering Institute of Canada, succeeding Ernest Smith. Other officers are W. O. Scott, vice-president and chairman of meetings and papers committee; secretary-treasurer, T. V. Berry; assistant secretary, A. Peebles; executive committee, two-year term, T. Price, Major J. R. Grant and W. N. Kelly; one-year term, P. H. Buchan, to fill out the term of Air Commodore George Johnson, and P. L. Stroyan, filling for W. O. Scott. C. A. Davidson, elected at previous annual meeting, also has a balance of a term to serve.

# Election

## Southern Calif. League name new officers for 1940

Board of Trustees of the Electrical Development League of southern California for 1940 recently elected are Dealers, A. L. Berg, Berg & Berg; C. R. Coblentz, Barker Bros.; Elec. Appl. Mfgrs. & Distributors, H. D. Conklin, Edison General Elec. Appliance Co.; H. E. Sherman, Jr., Stewart-Warner; Electrical Contractors, Herbert L. Evans, Nicholas Electric Co.; Sidney F. Hill, Hill Electric Co.; Elec. Manufacturers, A. A. Schueler, Square D Co.; Jim Shirreffs, S & M Lamp Co.; Elec. Manufacturers' Agents, W. P. Swartz, Standard Elec. Mfg. Co.; E. I. Hannah, Maydwell & Hartzell.

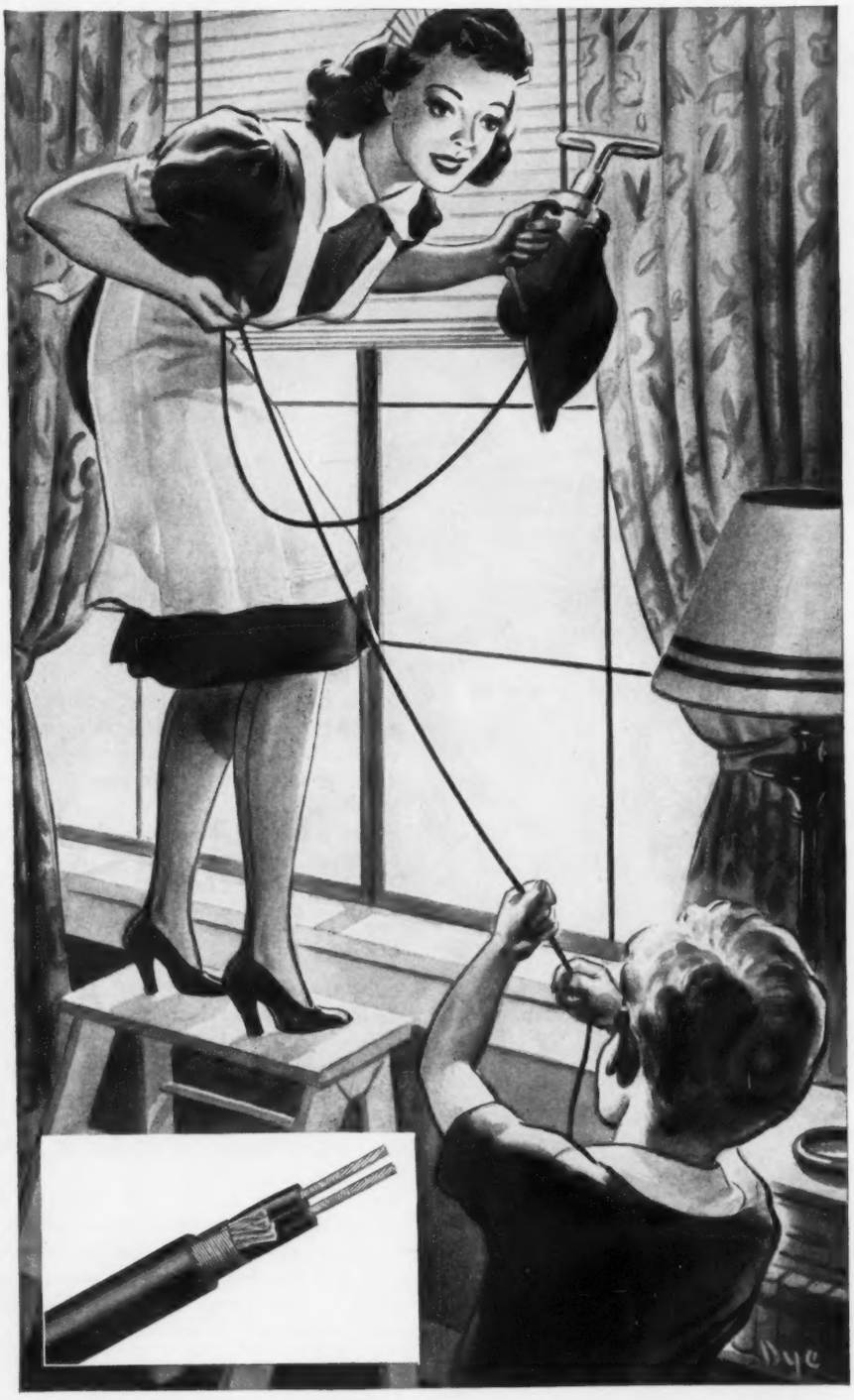
According to F. L. Hockensmith, who was renamed general manager of the League, the Public Utilities will be represented by Burdett Moody, E. V. Kane, Bureau of Power & Light; F. V. Frey, Pasadena Municipal Light & Power Dept.; C. E. Houston and Henry C. Rice, Southern Calif. Edison Co.; Electrical Wholesalers, D. A. Smith, Graham-Reynolds Electric Co. and W. E. Guy, Graybar Electric Co.

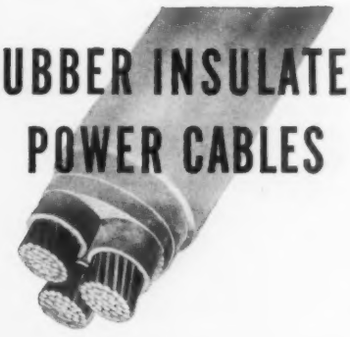
Chairman of various committees are Graham Holabird, Membership; Wm. Cranston Jr., Appliances; John Duncan, Adequate Wiring; E. J. Cipperly, Industrial Power & Heating, and Alston Rodgers, Commercial & Industrial Lighting.

## Contractors Re-elect

As a vote of confidence and support in their trial, the Electrical Contractors Assn. of San Francisco, Inc., unanimously reelected all of its officers and directors for 1940 at the annual meeting Jan. 25. This vote returns to office Carl C. Severin, Severin Electric Co., as president; George W. Abbett, Abbett Electric Co., vice president; George E. F. Smith, Smith Electric, treasurer; Edward Martin, Sterling Electric Co., secretary; and William Weindorf, Weindorf Electric Co.; Edward Scott, Edward J. Lynch Electric Co.; G. Walter Spencer, Spencer Electric Co.; Clyde L. Chamblin, California Electrical Construction Co.; James Surtees, Twin Peaks Electric Co.; Bert Doherty, B. J. Doherty Co.; and Thomas Harris, H. S. Tittle Co. as directors. The association and its officers are under indictment for violation of the anti-trust laws in the Federal administration's drive on the construction industry. Preliminary hearing was set for Feb. 5.

# *From Portable Cords to*





## RUBBER INSULATED POWER CABLES

### OVER 60 TYPES OF ROEBLING ELECTRICAL WIRES AND CABLES

*including:*

Rubber Covered Wires and Cables: Code; Performance; and Heat Resisting; Plain Rubber 60% sheath Power Cable and 40% and 60% sheath Flexible Cords

Power Cables: Paper; Cambric; Rubber

Parkway Cable, metallic and non-metallic

Service Entrance Cable

Slow-Burning Wires and Cable

Weatherproof Wires and Cable

Police-Fire Alarm Cable

Appliance Cords

Annunciator and Blasting Wire

Network Cables

Magnet Wire

Welding Cables

And a wide variety of other wires and cables; either Standard or to Customer's Specifications

### QUICK SHIPMENT

Prompt Service is available at all offices and warehouse points listed below, where large stocks of a wide variety of standard Roebling Wires and Cables are always on hand. Your request for information, prices or samples will be welcomed.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco, Los Angeles, Seattle, Portland

IF IT'S ELECTRICAL WIRE OR CABLE **ROEBLING** HAS IT!

# A Hotel Keeps in Step With Electrical Progress

For ten years, this beautiful and imposing structure stood unfinished. Then last year it was completed and it became the new Hotel Vancouver in the charming city of Vancouver, British Columbia. Considerable revision of the original contract and tender specifications had to be made to meet the changing conditions in the field of electrical installation during the past decade

TEN years make a difference—a big difference in electrical practice. Nowhere was this so dramatically made apparent as in the case of the new Hotel Vancouver, at Vancouver, B. C., started by Canadian National Railways ten years ago and just finished in 1939. The ideas of the original engineers, and the original specifications had to be brought up-to-date and in keeping with the progress of ten years that had elapsed from the original start on the hotel building to its hurried completion in 1939. In the electrical installation particularly this lapse of a decade caused considerable revision of the original contract and tender specifications.

One of the main re-arrangements was in connection with the revision of the power system to enable single phase 110/220 volt, 60 cycle alternating current energy to be used exclusively throughout the lighting distribution system of the hotel either from the three steam d. c. generating units or from the regular power reserves of the B. C. Electric Railway Co.

Under this rearrangement the 2-400 kw. and 1-300 kw., d. c. 110/220 Crompton Parkinson generators are not called upon to deliver three wire lighting energy to the hotel distribution system, but only furnish 220 d. c. volt power for the motor and elevator drives throughout the building.

Direct current energy from these generators is used for driving the 300 kw. auto-synchronous motor generator sets, using the d. c. ends as motors and the a. c. units as 2300 volt generators. The original generators were used for this reverse flow of power with necessary readjustments in the switching and control arrangements.

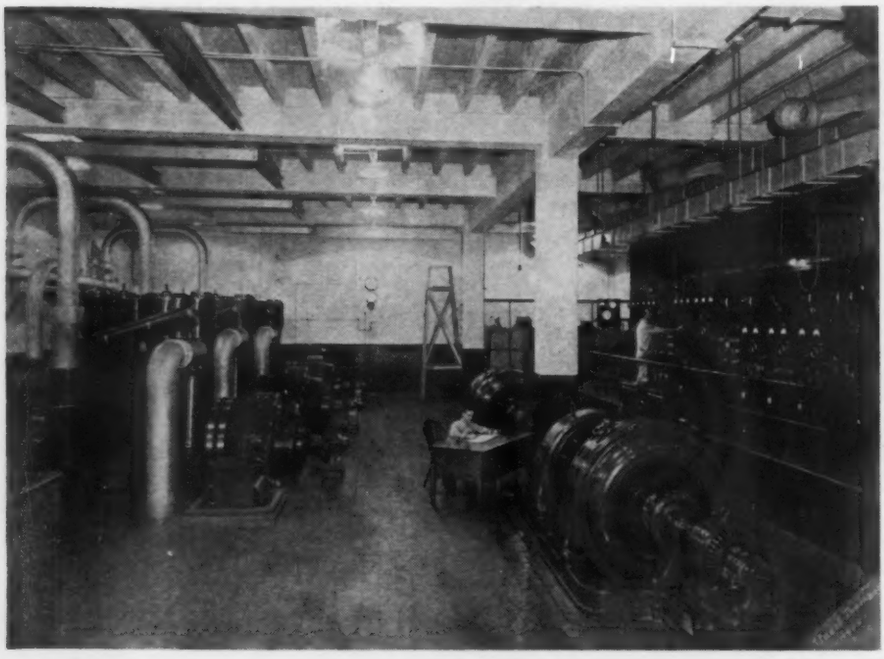
### Original Scheme

In the original scheme the generators were 2 wire, compound wound, and whilst it was still desired to be able to make the power flow through the sets as originally intended, namely to have the a. c. side motoring and the d. c. side generating, in case sufficient d. c. power was not available from the hotel sets, nevertheless under the rearrangement the flow from d. c. to a. c. is in the usual direction.

The difference in the output from the d. c. machine as against the input motoring is not a serious factor, as both a. c. anl d. c. units were designed for 40° rise and guaranteed to operate with a 25% overload for two hours without heating. The a. c. sets of course are of larger size than the d. c. units, as when motoring, the a. c. unit would have to supply the losses in the d. c. machine in addition to the power delivered. Based upon an a. c. efficiency of 94% the d. c. output as a motor, when called upon to drive the d. c. unit as an alternator, would not have the capacity by this 6% to supply the losses as well as the output of the a. c. unit acting as a generator. It followed from this that instead of having a 25% overload capacity for two hours at 300 kw. it would only furnish 282 kw. plus 25% overhead for two hours, and that the set therefore must be regarded as having a capacity of only 282 kw. continuous and 350 kw. for two hours when operating in the reverse direction. The a. c. unit, of course, is on the large side.

### New Requirements

In order to equip the plant to correspond with these requirements it was necessary to enable the compound winding to be cut out when the d. c. end was motoring, and provision had also to be made for starting up either of the d. c. machines from the d. c. side with a



Steam engines and d.c. generators are at the left in this view of the Hotel Vancouver engine room. The changeover alternating-direct generator motors are at the right, with the main switchboard rear right. Single-phase 110/220-volt, 60-cycle alternating-current energy is used exclusively throughout the lighting distribution system of the hotel from the three direct-current generating units

GRAYBAR customers in each of these fields get extra benefits from the fact that the specialized service they receive is part of a well-rounded whole... centered on the problem of supplying "everything electrical"... banded together in encouraging greater utilization of electrical ways of doing things. » » » Utilities gain when dealers are aided in offering better lighting, better electrical appliances... contractors gain when the promotion of more electrical equipment creates need for adequate wiring in construction or modernization... dealers gain when power lines are more trustworthy, and contractors more fully informed on modern wiring supplies. And the gains for all three are maximized by GRAYBAR'S insistence that the products it distributes meet quality standards making for sound performance and satisfactory service to all concerned.

To get your share of the "plus values" of this well-rounded service... get in touch with your local GRAYBAR branch today.

**Among the 60,000 items**
***Distributed by***
**GRAYBAR**

**FOR THE UTILITY**—Poles and pole line hardware, wire, cable, insulators, tools... "everything electrical" a power and light company needs.

**FOR THE CONTRACTOR**—Lighting fixtures for offices, stores, homes, ventilating equipment, all types of wire and wiring supplies.

**FOR THE DEALER**—Table appliances of all types, mixers, irons, electric shavers, G-E Mazda lamps.

**OFFICES IN 82 PRINCIPAL CITIES • EXECUTIVE OFFICES: GRAYBAR BUILDING, NEW YORK, N. Y.**

standard type of d. c. starter. This starter must be cut out in the normal running condition.

When the unit is transforming d. c. to a. c. power, provision has to be made for a. c. voltage regulation by means of voltage regulators, and it is also necessary to provide for close frequency regulation. It has been done by means of a motor driven shunt field rheostat connected into each of the d. c. units. These resistances are controlled by means of a relay device operated from a frequency relay type of movement. The motor control on the shunt field rheostat is also designed to prevent hunting and over-running.

**Meters**

Ammeters on the d.c. side have center zero movements, so as to read both ways. The d.c. watthour meters on these sets were eliminated and two watthour meters provided on the a.c. side of each unit. These watthour meters are provided with ratchet escapements and connected to read power passing through them in opposite directions, that is to say one movement reads a.c. power input from the B.C. Electric's supply system, and the other meter reads a.c. power output from the units when generating.

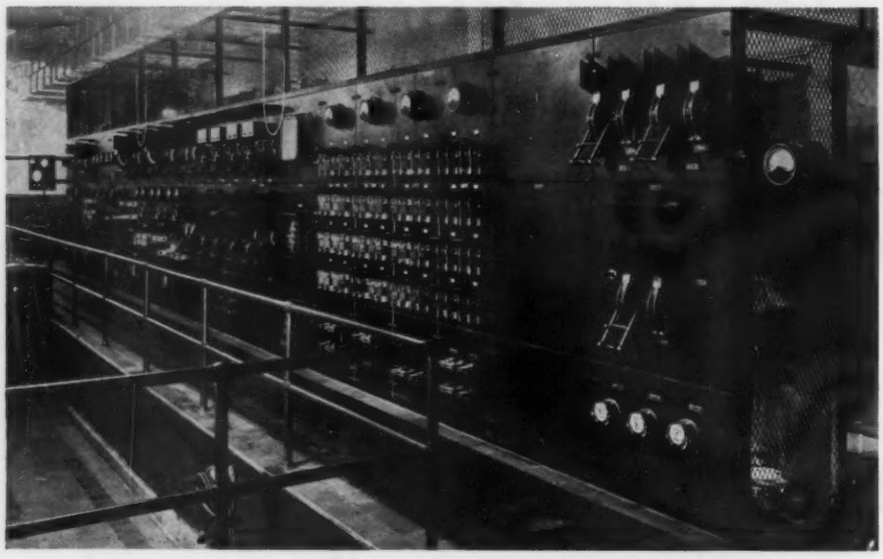
It was possible to take care of synchronizing between the a.c. generators without any special equipment as the a.c. units were designed as motors with their own starting equipment, and when one is running the other can be started up from it in the ordinary way from the a.c. side. The d.c. machine can then be switched for motor operation and the D.C. unit paralleled with the d.c. buses with its voltage slightly below the d.c. bus voltage. The unit thus becomes converted from d.c. to a.c. power, the amount covered being determined by the shunt control of the d.c. machine.

There are two a.c. incoming services from the power company supplying the main a.c. bus. The switches controlling these services are interlocked to prevent more than one being closed at a time. In order to synchronize the a.c. generators with the power company's system a small synchronizing panel was installed in the switching sub-station and provided with a synchroscope and two sets of receptacles and one synchronizing plug.

B.C. Electric power is delivered to the hotel transformer vault at 2300 volts and stepped down by a battery of three 2300 volt 110/220 transformers of 100 kva. each, while there are three similar transformers of 75 kva. each in reserve. The steam driven generators handling the production of the hotel power comprise one 300 kw., d.c. 110/220 v. set and two 400, k.w. d.c. 110/220 V sets and two 200 kw., 110/220 sets.

Each dining room, banquet hall, salon suite, etc. is completely equipped with a three channel public address system, making it possible to hear any speaker in any of these places clearly in any other of the rooms, or in the room in which he is speaking. Microphone outlets are built in in such a way that the guests are unaware of their presence. This system is also connected by telephone circuits to all Vancouver broadcasting studios, so that programs can be brought into the hotel, or sent out from it at will.

Main switchboard here is equipped with circuit breakers (at the right) for the utility's power service. Change-over switching equipment is stationed near the other end



Each bedroom is wired for use of a standard radio receiver, and there can be approximately 600 of these in operation at once, all connected by means of a recently developed master antenna system, and although all these receivers are connected from one antenna there will be no interference from one to the other.

Many new lighting schemes are introduced in the public rooms. For example the panoramic roof garden dance floor on the 15th level is decorated with invisible colored lights giving any desired color effect, and with the intensity regulated by use of the thyratron tubes.

This spectacular painting with lights concealed in the walls, in the rails of the balcony, around the stage, in the light troughs around the top of the pillars, and elsewhere gives possibilities of almost infinite change in design and tints.

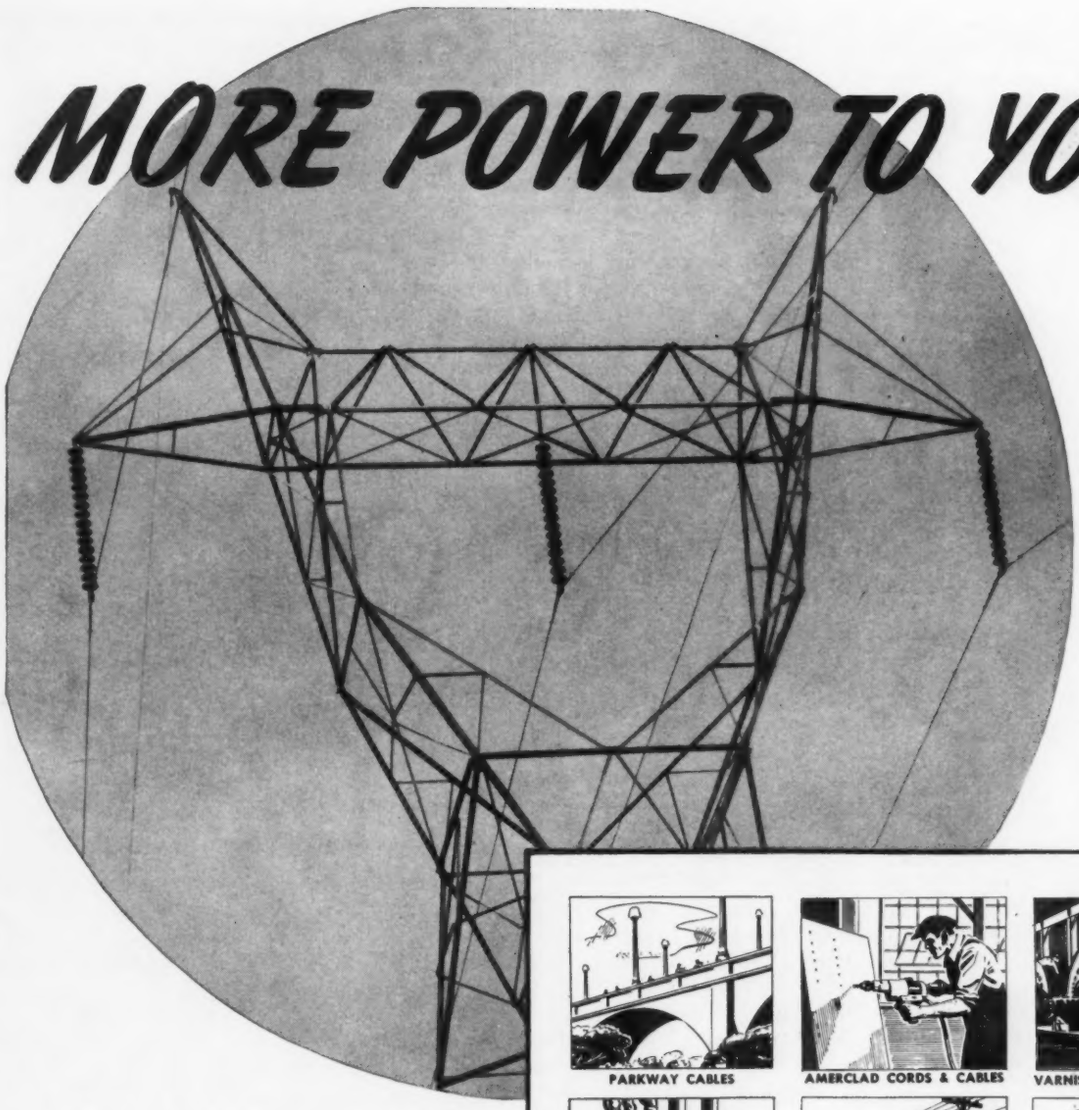
On an average seven high grade electricians were employed on the hotel job steadily for the past six years by Hume & Rumble, Ltd., electrical contractors, the actual work being spread over almost ten years. R. H. Williams, then with Hume & Rumble, Ltd., was the chief engineer on the job for the electrical contractors. C. H. Borton was superintendent and W. G. Daley, construction foreman. Prior to coming to Vancouver on this installation Daley was in charge of the electrical system at the Empress Hotel, Victoria, having installed that system with Hume & Rumble, and history has repeated itself, for following the Hotel Vancouver installation he left Hume & Rumble once more to return to the hotel field as chief electrician in the Hotel Vancouver.

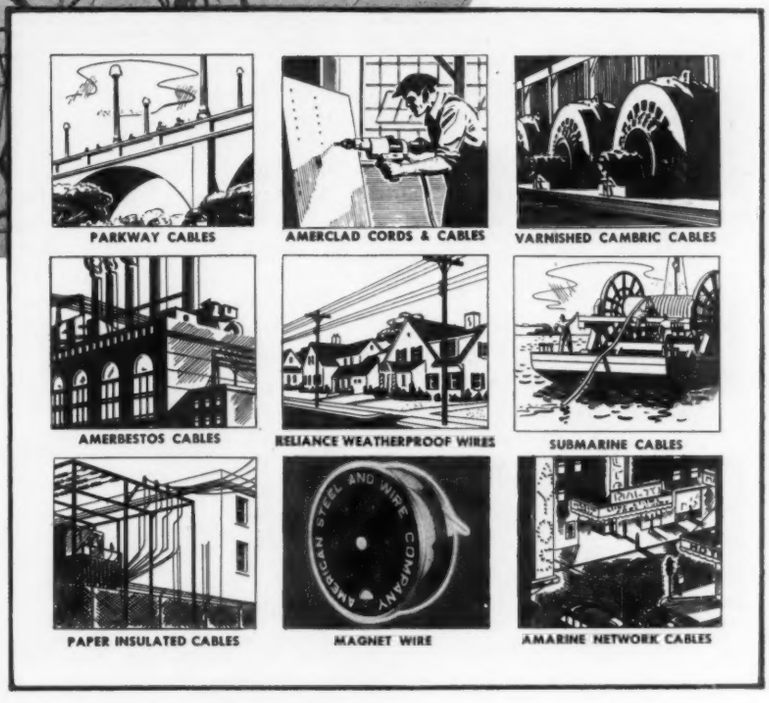
Supervision of the entire electrical installation for the hotel was in the hands of N. S. B. "Norman" Watson, who joined the Canadian National Railways in 1926 and was transferred to the Architect's Department at Montreal in 1929.

● DUMMY SWITCHBOARD panels are being made by electrical engineering students of the Grays Harbor Junior College at Aberdeen, Wash., under the direction of Professor Earl C. Rex. Models of the panels at the Univ. of Washington and Washington State College will be made first.

● FIRST CERTIFIED ADEQUATE WIRING CERTIFICATE to be issued in Ogden, Utah, was awarded last month to T. N. Larsen, a prominent Ogden building contractor. Elias Strong, manager of the Electrical League of Utah, and A. N. Vendall, secretary of the Ogden division of the league made the presentation.

# MORE POWER TO YOU!





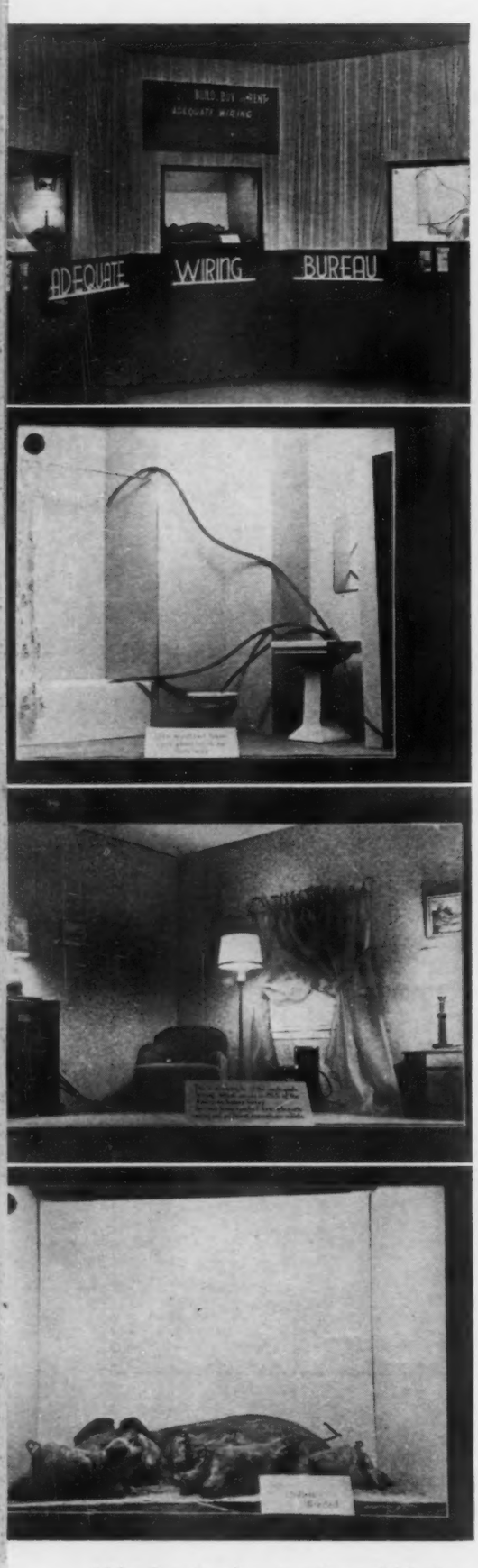

TRACE the developments made in the electrical wire and cable field and you trace the history of the American Steel & Wire Company. For more than a century we have been developing new products, as well as improving and modernizing the old. During more than 100 years of wire making we have encountered innumerable problems in a field notable for progress and invention. In that period we have built up a background of experience that is always at your service.

ADEQUATE WIRING SERVES AND SAVES

USS

COLUMBIA STEEL COMPANY, *San Francisco, Pacific Coast Distributors of Electrical Cords & Cables*
*Manufactured by*
AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
United States Steel Export Company, New York

UNITED STATES STEEL




Idaho Power's adequate wiring exhibit shown above has attracted more than 35,000 persons, each panorama telling in a novel and amusing way the need for sufficient electric outlets

# Exhibit

## Idaho Power Co. display drives home adequate wiring story

Originally shown in the local Adequate Wiring Bureau's booth at the Western Idaho State Fair in Boise, August 22-26, a novel and amusing exhibit is now being shown at numerous shows and country fairs throughout the territory by the Idaho Power Co. It is estimated that some 35,000 persons have already seen this display and many more will see it before it completes its circuit.

The exhibit consists of three panoramas each behind a window glass. One window shows a bathroom with modern fixtures, except that the plumbing was done with rubber hose running from the "4-way water outlet" around the walls to the various fixtures. A placard states: "You wouldn't do your plumbing this way".

Another window reveals a modern livng room with a miniature chair, radio, table, two table lamps and a floor lamp. The three lamps and radio are plugged into a single convenience outlet by means of two triple outlet plugs, and the cords are run long distances to the appliances. The three lamps furnished the only light in the small room. A placard explains as follows: "This is an example of the inadequate wiring which exists in 75% of the American homes today. For real home comfort have adequate wiring and sufficient convenience outlets."

The key window reveals a mother pig with her litter at feeding time. Two little unfortunates can find no place to feed, and therefore, "More outlets are needed".

The exhibit was assembled by R. H. Severins of the Idaho Power Co. in cooperation with the following dealers: Alloway Electric, Fairview Electric, B. J. Wilson Electric, Electric Service Co., Pope Electric Co. and Gem State Electric Co.

# Proposed Code

## Seattle to discuss new code allowing thin wall insulation

Thin wall insulation will be permitted in a proposed new code which has been under discussion during recent weeks by a representative industry committee headed by Beverly A. Travis, contractor, City Electric & Fixture Co.

Drafting of a definite code to be submitted to the city council was, however, deferred until the matter could be discussed further with Magnus Crawford, Puget Sound Power & Light, a member of the national code committee, who was attending sessions in the east during the latter part of December.

Members of the committee include: Roger Walker, Puget Sound Power & Light; Larry Muth, City Light; William S. Gaunt, Local 46, I.B.E.W.; E. E. Lee, chief electrical inspector, City of Seattle; R. D. Horning, secretary-manager, Seattle Electrical Contractors' Assn. and L. J. Bendetti, president of the contractors' group, serving in an ex-officio capacity.

Thin wall insulation should be allowed in modernization work involving older structures, the committee believes. Its use would prove a distinct stimulus to re-wiring of buildings now electrically obsolete.

The proposed Seattle code will follow the national pattern with the exception of certain local modifications not yet fully worked out.

# New Ordinance

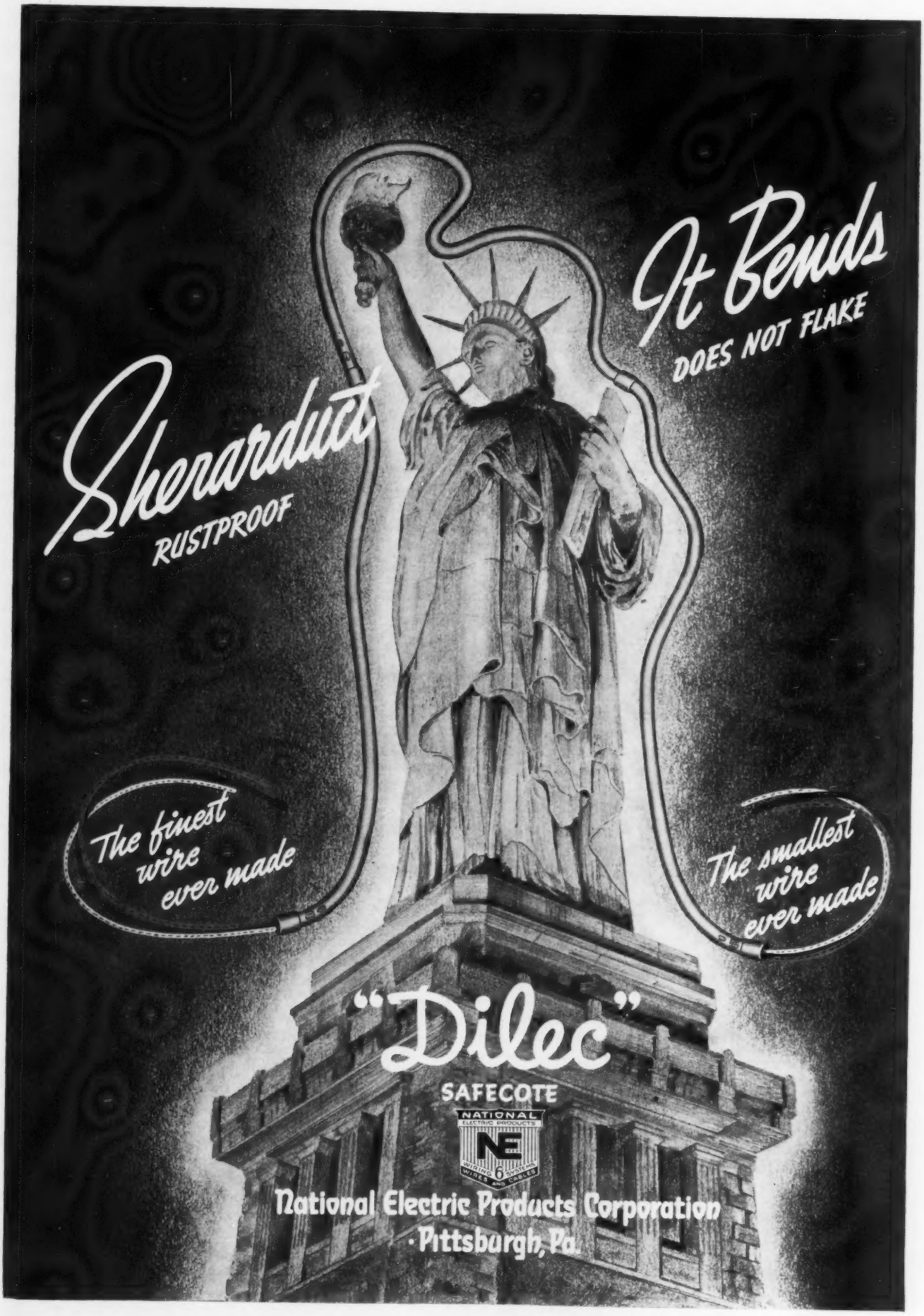
## Los Angeles electric code explained by local League

New electric ordinance, effective Jan. 7, was explained to electrical contractors of Los Angeles in two series of meetings during November and December at the Board of Public Works session room in the City Hall. Meetings were called at the direction of the Electrical Development League of Southern California, which had sponsored the revised ordinance.

Graham Holabird, president of the League, presided and turned the discussion over to R. H. Manahan, chief of the Electrical Division, and to O. K. Jones, chief electrical inspector. Average attendance at the meeting was over 200.

Several years in the making, the new code contains only half as many words as the former edition, is more specific, and embodies many new adequacy provisions.

● The Federal Power Commission has issued a comprehensive 73-page report on average electric bills for all classes of service through the U. S. titled "Average Electric Bills—1939," the report summarizes data recently published by the Commission in a series of state reports which showed typical monthly bills for residential, commercial light, commercial power and industrial electric services. It is illustrated with 33 charts and maps. The lowest average bills are distributed among three states, California, Washington and Tennessee.


Sherarduct
RUSTPROOF
It Bends
DOES NOT FLAKE
The finest wire ever made
The smallest wire ever made
"Dilec"
SAFECOTE
NATIONAL
ELECTRIC PRODUCTS
WIRES AND CABLES
National Electric Products Corporation
Pittsburgh, Pa.

# NEWS OF THE INDUSTRY

## GROUP MEMBERS ASK STEPS BE TAKEN ON SHASTA POWER

Representatives of more than a dozen cities, irrigation districts and utility districts appeared at a meeting of the California Water Project Authority in Sacramento Jan. 16, to ask that the authority take steps for the distribution of Central Valley electric energy direct to these agencies.

Royal Miller, president, and Stephen W. Downey, attorney for the Sacramento Municipal Utility District, one of the largest presently organized potential consumers of Shasta Dam power urged that the authority make the district a firm offer not later than May 1st.

"The district, of course, wishes to secure power at the lowest possible cost, and under the most favorable conditions," Downey said. "Shasta power would seem to be the answer."

From the San Joaquin Valley, representatives of West Stanislaus Irrigation District, West Side Irrigation District, Byron Bethany Irrigation District, the Patterson Mutual Water Company and the Central San Joaquin Municipal Utility District told the Authority they felt present electric rates charged by the private utilities serving them were exorbitant and asked steps be taken to provide them with power from the Central Valley Project.

Resolutions and letters recommending similar action were presented by the California Municipal Utilities Assn., representing 25 cities and public agencies in the state, the Modesto Irrigation District, the East Contra Costa Irrigation District, the cities of Roseville and Lodi.

Chairman Frank W. Clark of the Water Project Authority, assured the petitioners that the Authority would make every effort to comply with their requests and would lend every assistance possible in cooperating with the various public agencies.

#### Use of State Appropriation

Use of $50,000,000 of the state's $170,000,000 bond issue for the Central Valley project was opposed by two veteran project supporters last month. This sum is needed to promote distribution and marketing power through publicly owned agencies.

The $170,000,000 is the "second line of defense" and should be left intact to assure completion of the project in the event further Federal appropriations are not forthcoming, Clarence Breuner, president of the Central Valley Project Assn., declared.

He was supported by State Senator Jack Metzger, co-author of the Pierovich Central Valley bill at the last session of the legislature. Metzger denied that the association was fighting on the side of private power companies.

## INTERRUPTION

All because the West Coast Power Co.'s high-tension supply line snapped recently near Richfield, Idaho, the following happened: electrically operated ski-lifts at Sun Valley were motionless for five hours . . . barbers of Wood River Valley cut hair by hand . . . the Hailey Times went unpublished . . . miners in the Triumph Mine formed bucket brigades to keep the water level down in the tunnels . . . and undoubtedly a lot of irons, toasters, sweepers, lamps went off. Houses went uncleaned, people went unfed, cows went unmilked, quite a few people got good and cold, a lot went without hot water. While power failures are seldom, this one goes to show what electricity means today, and especially to people in rural areas.

## POWER SITE CASES MAY GO TO FEDERAL COURT IN SPOKANE

Cases involving the Federal government's acquisition of power sites near the mouth of the Spokane River and at Kettle Falls on the Columbia River, are expected to go to trial in Federal Court in Spokane, according to United States Attorney Sam M. Driver. The government has taken title to the land and has posted cash for the estimated value with the federal court clerk. However, the Washington Water Power Co., which owned the Kettle Falls power site, and the Big Bend Transit Co., owner of the Narrows site near the mouth of the Spokane River, both announced they will contest the valuations set by government appraisers.

It is expected that another lawsuit will result from the government's attempts to acquire the property of the White Pine Sash Co. below Kettle Falls, due to failure to agree on price. All of the land in question will be inundated by Grand Coulee dam backwater.

## PUDS GRANTED FREE ACCESS TO PUGET SOUND RECORDS

Ruling in favor of the Washington State Grange and Public Utility Districts of Cowlitz, Chelan, Douglas, Kittitas and Whatcomb Counties in Washington, the State Department of Public Works, at Olympia, Wash., on Jan. 10 granted PUDs "free and unobstructed access to all of" the books, records, accounts and properties of the Puget Sound Power & Light Co.

The department also announced that it will "immediately commence an investigation of the Puget Sound Power & Light Co.'s books, records, accounts and properties for the purpose of making proper valuations and establishing fair, just, reasonable and sufficient rates for the sale of electric energy by said company at wholesale to public utility districts and to rural cooperative power systems."

#### Order Signed

The order, which was signed by A. M. Garrison and Ralph J. Benjamin, swept aside a company argument that the PUD attorneys were seeking the information as "subterfuge" in order to get the company's books for use at condemnation proceedings already started against the company by several of the districts.

An initiative requiring a vote of the people before bonds are issued by a public utility district has been filed with Secretary of State Belle Reeves at Olympia, Wash., sponsors of the measure declaring that "it would subject the PUDs to the usual safeguards incorporated in all laws of a similar nature".

The sponsors, Harry Whiteman, Wenatchee; Ed Morley, Aberdeen; Walter F. Fisher, Bellingham, declare that the measure, if approved by the voters "will decentralize power now placed in the district commissioners and return that power to the people".

#### District Bill Passed

The district power bill was passed as an initiative in 1930 authorizing establishment of the utility districts. A recent supreme court decision held that the commissioners of such districts have authority to acquire utility property and to issue utility bonds in payment therefor, without first obtaining approval of the people in an election.

The current initiative would require approval of the voters of any utility district for "authorization of any bonds,

# QUESTION:

## *Can You Name*

# 5 IMPORTANT

## WIRE AND CABLE DEVELOPMENTS MADE IN 1939?

★ ★ ★

**ANSWER:**

1. **FORMEX** Magnet Wire
2. **THINWOL** Control Cable
3. **NO. 1799** Varnished-cambric Cable
4. **GAS-FILLED** Paper-insulated Cable
5. **NEW LEAD-SHEATHING PROCESS**

CREDIT 1939 with being an outstanding year for insulated cable. More important G-E cable developments were brought to successful conclusion than in any other year that we can recall. These developments deserve attention for the savings, improved safety, and other far-reaching benefits that they make possible.

**1. FORMEX**

FORMEX identifies a new G-E magnet wire that consists of a copper conductor coated with a high-quality insulating film of synthetic resin. In addition to excellent electrical characteristics, Formex magnet wire has outstanding mechanical properties. It is remarkably strong, tough, and flexible, and needs no additional protective covering. It can be wound at very high speeds, and utilizes coil space to the maximum advantage. Thus, it offers many opportunities for making improvements in the design of electric equipment.

**2. THINWOL**

THINWOL is a new 85-per-cent new-rubber insulated cable for fire-alarm, traffic-signal, supervisory, and other multiconductor control circuits. This new insulation has a guaranteed tensile strength of 3500 lb per sq in.; average test results show 5250 lb per sq in. An insulation thickness of 0.015 inch will stand a test of 1500 volts. Therefore, the cable can be made with very thin walls—thus saving space—and still have an increased factor of safety.

**3. NO. 1799 CAMBRIC**

This is a new varnished-cambric cable that has extra heat resistance. The cable can be run at a conductor temperature of approximately 10 deg C higher than the former G-E design. Of course, this means savings in copper, in overall diameter, in weight, in duct space, and in first cost.

**4. GAS-FILLED CABLE**

This development was announced in a paper presented at the A.I.E.E. winter meeting in New York on January 26, 1939. Gas-filled cable offers many advantages over other types of cable in the voltage range from about 15,000 to 33,000 volts. While this development is still considered somewhat in the experimental stage, the results from the systems now installed continue to prove the accuracy of design calculations.

**5. NEW LEAD-SHEATHING PROCESS**

This process has been in successful use for some considerable time. It represents, we believe, one of the most far-reaching steps ever taken to improve the quality of lead sheath particularly on paper-insulated cable.

Additional information on some of these developments is contained in the *G-E Review*, January, 1940. Other details can be obtained from one of our cable specialists through the nearest G-E sales office. General Electric Company, Schenectady, New York.

**GENERAL ELECTRIC**

6016-188

securities, or other financial obligations to be issued or incurred, and for authorization of the proposed plan or system pursuant to which such property is to be acquired."

A committee featuring the slogan "let the people vote" will be organized to obtain the 50,000 legal signatures necessary to place the initiative on the November election ballot. Joseph Wicks of Okanogan will head the committee.

## Grays Harbor Customers To Get Rate Reduction Before June

Power consumers in the Grays Harbor, Wash., territory may expect at least a 10 percent reduction in their light bills before Bonneville power arrives in Aberdeen in June, according to C. B. Sherwood, president of the Grays Harbor PUD, and further reductions may be expected after power from the big dam starts pouring into the city. The first cut will probably be in the form of a rebate to consumers who pay their bills promptly, Sherwood states.

The Grays Harbor PUD, which recently took over the properties of the Grays Harbor Railway & Light Co., has sold $3,350,000 in revenue bonds to a Seattle-Chicago syndicate, the price being par and interest rate 4½%. The district accepted a $33,500 down payment, and will deliver the bonds and were to receive the balance about Jan. 20. The bonds will be reprinted, replacing those printed six months ago when the PUD first entered into a bond agreement with the syndicate, the reprinting giving the district an extra six months in which to build up its reserve for payment of interest and principal on the bonds. The bonds will be printed in series of $1,000 each and will be available to Grays Harbor investors. The PUD commissioners decided against RFC financing, as involving too much delay, and because of the fact that the agreement with the private syndicate could be extended any time at the option of the syndicate.

### Standard Contract

The commissioners are considering a standard form of contract left with them by Charles E. Carey, chief consulting engineer of Bonneville, which, with several changes necessitated by the fact that the Harbor PUD will also sell power from its own steam plant, will probably become the agreement. Carey offered the PUD 5,000 kw. of prime power, delivered at the south limit of Cosmopolis, and brought from there to Electric Park over the 23,000 volt line the PUD will acquire, when it takes over the company.

Bonneville, which has contracted to buy the Raymond-Cosmopolis line from the Willapa Electric Co., will build a small substation at the south limit of Cosmopolis to meter the power as it pours into the PUD high tension line. The standard contract runs for 20 years, the prime power offered on a $17.50 kw.-yr. basis, subject to readjustment every five years. It also provides an exchange of power in the event the Raymond-Cosmopolis line breaks down and the PUD must service customers solely from the steam plant.

## Beck Named Grays Harbor PUD Manager by Unanimous Vote

Robert W. Beck, former engineer for the Bonneville power project, and consultant of the Grays Harbor PUD during the survey of the Grays Harbor Railway & Light Co.'s holdings, has been named manager for the Grays Harbor Public Utility District, by unanimous vote of the district commissioners.

As consulting engineer during the power survey, Beck was largely responsible for the fixing of a valuation of $2,842,000 for the Power Co.'s properties. He upheld the valuation as a fair figure in the recent court test, although other engineers contended the figure was $500,000 too high.

The first task confronting Beck is to conduct an inventory of the power company's holdings to see if they correspond to the inventory as detailed in the purchase contract.

The Federal Light and Traction Co., parent firm of the Grays Harbor Railway & Light Co., extended the purchase contract until Feb. 16, giving the PUD another month in which to complete plans for taking over the utility. However, the commissioners are confident that the deal will be consummated befor that date.

When John Bayha, Aberdeen taxpayer, and the city of Aberdeen started suit to halt the purchase, the delivery date was changed from September to November, and finally to Dec. 20. Meanwhile, the PUD had agreed to return the syndicate's $50,000 down payment and to give it a 90-day option on the bonds after the agreement expired. When the syndicate on Dec. 19 again offered a new delivery date of Jan. 19, the PUD rescinded the supplementary agreement providing for the option.

● PORTLAND CANAL POWER CO.'s application for amendment of license for Project No. 917 was denied by the Federal Power Commission last month. Surrender of the license was ordered within 30 days of receipt of the order. Project license was issued in 1931, and was for electric power development on the Davis River, near Hyder, Alaska.

## Skamania County PUD (Wash.) Purchases West Coast Power

The PUD of Skamania County, Wash., on which the north end of Bonneville Dam rests, became the first PUD of that state to purchase properties of a private utility company when on Jan. 2 it paid the West Coast Power Co., Portland, $40,000 for approximately 35 miles of distribution line which had been serving 474 customers in and around Stevenson. This deal had been pending for some months and was closed on the day the contract with West Coast Co. would have expired. Way for its closure was paved by a decision of the Supreme Court of Washington, handed down Dec. 30, in the Grays Harbor PUD case, declaring that a District could legally contract for the purchase of utility properties from the sale of revenue bonds without a specific vote of the people of the District.

Funds for the purchase of the property were provided from the proceeds of the sale of revenue bonds of the District to Hartley Rogers & Co., an investment house of Seattle, Wash., and John Nuveen & Co., Chicago. The deal included the payment of a commission amounting to $1,300 to Guy C. Myers, financial agent who negotiated the purchase contract with West Coast Power Co. The District has authorized a total of $79,000 in bonds.

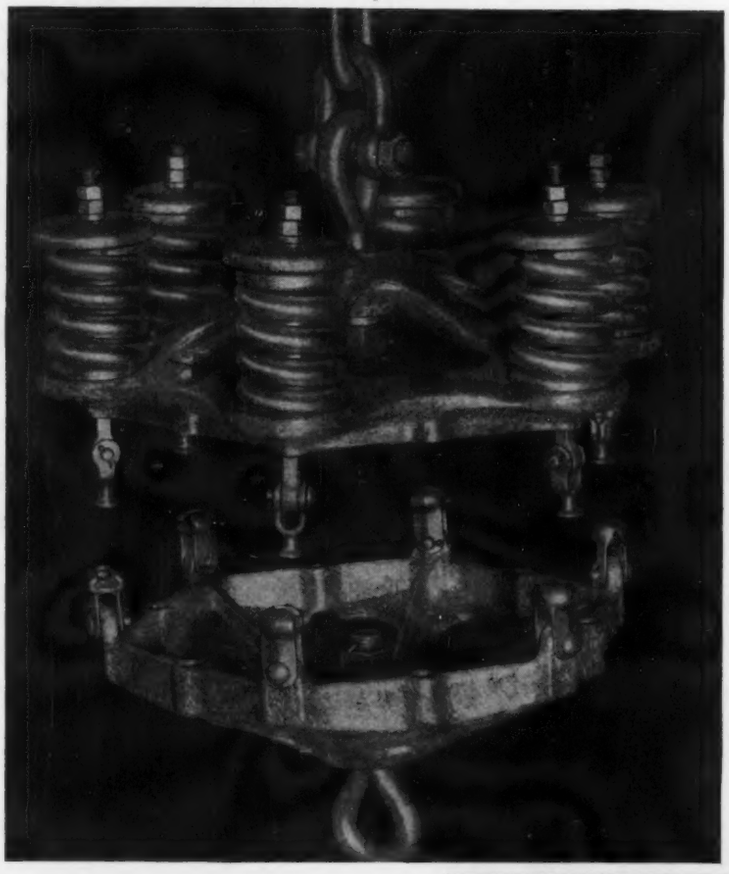
Following the purchase the Stevenson area of the District began receiving power from Bonneville under a contract to take 200 kw. previously negotiated with Bonneville under the administratorship of Frank A. Banks. Now service is rendered from Bonneville's 13,000 volt line on the Oregon shore, built to serve Cascade Locks, thence across the Columbia via the line formerly owned by West Coast.

Skamania's PUD's contract with Bonneville is unique in that the District is paying the at-site rate for power of $14.50 per kw.-yr. plus $1.25 per kw. for the use of the transmission system. The Bonneville Administration advises that this rate is available to purchasers within 15 miles of the Dam. No re-sale rates for the District are written into this Bonneville contract.

The territory now being served is only a small part of the District, other sections of which are served by Pacific Power & Light Co.

● WITH CONSUMER CONTRACTS already signed in the Glenwood and Trout Lake areas of western Klickitat County, Goldendale, Wash. county seat, plans are now being made for the construction of 40 miles of rural electrification lines, according to Martin Lumijarvi, Klickitat County PUD commissioner.

# 6 Strings.. and Equalized



WE'RE going to cross the Columbia and regulations force us to go up nearly six hundred feet. We'll dead end on six eighteen-unit strings. STRING LOADINGS MUST BE EQUALIZED, both with fairly low initial tensions and high maximum design loadings. Yes, and while you are at it, figure out a way for Dan to get them up in the air.

"Brother," we said, "We're drop forgers, not magicians!"

Did we do it? Sure we did, take a look at the picture. We designed it and what we couldn't forge we bought. Which all goes to prove that there is more to this business than a drop hammer.

**THE BREWER-TITCHENER CORPORATION**

**Cortland, New York**

*Through Your Insulator Manufacturer only*

**MORE THAN A FORGING**

**• • •**

**A *SERVICE!***

BTC

*Ask us Another!*

## Bonneville Signs 20-Year Contract with McMinnville, Ore.

The Bonneville Power Administration on Jan. 18 signed a 20-year contract with the city of McMinnville, Oregon, for the sale of 1,000 kw. of firm power and varying amounts of surplus energy generated at Bonneville dam.

The contract will become effective as soon as it has been ratified by the voters of McMinnville under a provision in the city's charter. Officials said an election would be held within a month.

Immediately following execution of the contract, M. H. McGuire, manager of the McMinnville water and light department, announced sharp reductions in the city's retail power rates to become effective upon delivery of Bonneville power in Oct., 1940.

The new schedule permits savings up to 31% for residential consumers and as high as 44% for commercial lighting. Under terms of the contract with Bonneville, the new rates are devised to insure a financially sound and self-supporting system. They provide for the payment of all reasonable operating expenses, interest and matured principal on debt, renewals and replacements of plant, depreciation and tax equivalents.

Comparison of the bills under McMinnville's present rates made possible by Bonneville power under the proposed new rates follows:

| | | Present Rate | New Rate | Per cent Reduction |
|---|---|---|---|---|
| Residential: | 40 kw-hrs. | $2.00 | $1.40 | 30.0% |
| | 100 kw-hrs. | 3.20 | 2.75 | 14.1 |
| | 250 kw-hrs. | 6.20 | 4.25 | 31.5 |
| | 500 kw-hrs. | 8.20* | 5.75 | 29.9 |

* Including 250 kw-hrs. at separate meter water heating rate.

Commercial lighting bills compared under the present and the new rates:

| | | Present Rate | New Rate | Per cent Reduction |
|---|---|---|---|---|
| Commercial Lighting: | | | | |
| 150 kw-hrs. | (1.5 KW) | $ 8.00 | $ 5.25 | 34.4% |
| 375 kw-hrs. | (3.0 KW) | 16.25 | 9.75 | 40.0 |
| 750 kw-hrs. | (6.0 KW) | 26.25 | 14.75 | 43.8 |
| 1500 kw-hrs. | (12.0 KW) | 42.50 | 24.15 | 43.2 |

Retail residential schedules under the new rate are:

| New Rate (Urban and Rural) | | Present Rate (Urban) | |
|---|---|---|---|
| First 50 kw-hrs. | 3½c | First 30 kw-hrs. | 6c |
| Next 50 " | 2c | Over 30 " | 2c |
| Next 200 " | 1c | Minimum bill | $1.00 |
| Next 900 " | ½c | (Rural) | |
| Over 1200 " | ¾c | First 16 kw-hrs. | $1.25 |
| Minimum bill: | | Next 14 " | 6c |
| Urban | $ .85 | Over 30 " | 2c |
| Rural | $1.15 | Minimum bill | $1.25 |

The agreement, signed by Paul J. Raver, Bonneville Power Administrator, and Mayor R. H. Windishar of McMinnville, provides for the purchase of the firm power at the rate of $17.50 a year for each kw. of power guaranteed in the contract. The balance of the city's requirements will be supplied, when available, under the surplus energy rate of 2½ mills per kw.-hr. The city plans to operate its diesel generating plant for peaking purposes.

## Willapa Electric Co. in Washington Acquired by Bonneville

The Bonneville Power Administration Jan. 22 acquired the Willapa Electric Co.'s 66,000 volt transmission line in northern Pacific County, Wash., and its substation on the outskirts of the city of Raymond. It was Bonneville's first purchase of a private utility property for incorporation into its own northwest power grid.

At the same time, Pacific County PUD took over the Willapa company's retail distribution lines and became the third Washington PUD actually to acquire a private utility system for the sale of power to farms, homes and business in its area.

Others were Skamania PUD, which took over the West Coast Power Co. system in its boundaries on Jan. 4, and the Grays Harbor district, which acquired the business of the Grays Harbor Light & Power Co. Jan. 15.

Today's transfer was the result of a three-way contract executed in March, 1939, between Bonneville, the Pacific district and the Willapa company.

At that time, Bonneville agreed to purchase the Willapa company's 19-mile, 66,000 volt circuit between Raymond and Cosmopolis, on the outskirts


Gardner Transformer News!!

GARDNER ELECTRIC MANUFACTURING CO. is pleased to announce the appointment of MAYDWELL & HARTZELL, INC. Exclusive Sales Representatives for the Pacific Coast Area.

The combination of the GARDNER ELECTRIC MFG. CO., transformer specialists for 31 years, maintaining the only Western plant providing custom-built transformers for all purposes—and MAYDWELL & HARTZELL, INC., the largest established organization on the Pacific Coast devoting its activities exclusively to the sale of transmission and distribution equipment—will prove beneficial to the Electrical Industry in the West.

GARDNER

A GUARANTEE OF TROUBLE-FREE OPERATION

OUR NAME MAYDWELL SPELLS QUALITY

A REPUTATION FOR QUALITY and SERVICE

MAYDWELL & HARTZELL

INCORPORATED

*Engineers & Manufacturers' Representatives*

LOS ANGELES SAN FRANCISCO PORTLAND

of Aberdeen, and the Raymond substation, for $156,000 while the Pacific district purchased the company's distribution lines for $189,000.

In today's transfer, the Willapa company received a check for $136,000 from Bonneville. The balance of Bonneville's share of the purchase price amounting to $20,000 will be paid to the company as soon as remaining minor details of the transaction have been handled.

## Monmouth (Ore.) Purchases 400 Kw. of Bonneville Energy

Monmouth, Ore., entered into a 20-year agreement Jan. 5, with the Bonneville Power Administration for purchase of 400 kw. of energy. The contract was signed by Bonneville Power Administrator Paul J. Raver for the government and mayor F. R. Bowersox and recorder Elsie O'Rourke for the city.

Delivery of power by Bonneville will begin as soon as the city has acquired or purchased a distribution system. The city advised Administrator Raver it was negotiating with the Mountain States Power Co. for purchase of that company's facilities within and adjacent to Monmouth.

No retail rate schedules are set up in the contract, but stipulation is made that the city and administrator will agree on rate reductions before actual delivery of power begins. The new rates will provide amply for debt retirement, interest, and payments to the city in lieu of taxes now being paid by the private utility.

## Schultz Realigns Division Staff Duties at Bonneville

S. E. Schultz, acting chief engineer of the Bonneville Administration, announced a realignment of staff duties in his division at the end of the year. Henry R. Stevens, formerly in charge of the material and inspection section, becomes senior hydraulic engineer on the staff of Charles E. Carey, chief consulting engineer. Succeeding to Stevens' former position is Carl H. Bjorquist.

Other appointments are John P. Jolliffe to the position of assistant to the chief engineer; Raymond Slavin, administrative assistant to the chief engineer; Harry Stengel, chief clerk. The foregoing changes involve no additions to the staff.

## Tacoma Cancels Survey, May Use Bonneville Power

Vote on the proposed $150,000 appropriation for a survey looking toward expansion of the city of Tacoma's (Wash.) municipal power system, sponsored by Utilities Commissioner Ira S. Davisson, was deferred by the City Council until after conferences with Bonneville power officials on possible purchase of power from that source instead of expansion of the present system.

The Tacoma Chamber of Commerce sent representatives to the council meeting to deny charges that the Chamber is against municipal power, or is for lowering commercial electric power rates and raising domestic rates.

A. B. Comfort, who represented the Chamber of Commerce, stated that that body has been studying the possibility of a Tacoma power tie-in with Bonneville as possibly cheaper than expanding the city's system.

Vern Kent, superintendent of City Light, declared that Tacoma's plant is producing power at less than a mill and a half per kw., cheaper than Bonneville can produce it, and said, "Uncle Sam isn't Santa Claus. He can't sell below cost."

The final decision, agreeable to the various interests represented, was to make a careful study of the situation, and confer with Bonneville officials before undertaking an expensive survey of the City Light system.


Pacific Coast Headquarters for

TRANSMISSION and DISTRIBUTION EQUIPMENT

KEARNEY DISTRIBUTION EQUIPMENT
GARDNER TRANSFORMERS
POLE LINE HARDWARE

PORCELAIN INSULATORS
GLASS INSULATORS
WIRES AND CABLES
POLES AND CROSSARMS
WOOD PINS AND BRACKETS
GALVANIZED GUY STRAND
GALVANIZED IRON WIRE
TIME SWITCHES
CONSTRUCTION TOOLS

YOUR NAME MAYDWELL'S SELLS QUALITY

MAYDWELL & HARTZELL
INCORPORATED
*Engineers & Manufacturers' Representatives*
LOS ANGELES SAN FRANCISCO PORTLAND

## Bonneville Policies Explained To Repr. Pierce of Oregon

Bonneville Power administration's position with respect to resale rates for Federal power generated by Bonneville Dam were disclosed late last month by Secretary of the Interior Ickes. He made public a report prepared by Paul J. Raver, Bonneville power administrator, in response to a request by Representative Walter M. Pierce, of Oregon.

In his letter Pierce sought "to learn four things, (1) whether resale rates were embodied in the contract under consideration at Eugene; (2) presentation of negotiations with Eugene, (3) reason for leaving resale rates out of the short-term contract with Portland General Electric Co., and (4) Bonneville Power administration's general policy with respect to resale rates."

Raver declared that "the Eugene contract contained no provision for resale rates but did contain a statement of principles of operation which were agreed to by all members of the Eugene Board as consistent with their situation and guaranteeing local control over plant operation and power policy."

"The Portland General Electric contract contains no resale rate provisions," Raver asserted, "because it is purely a temporary agreement designed to take care of a serious power shortage." Concluding his letter to Ickes, Raver said, after stating the Bonneville general policy, "that in some instances, as Eugene, it will be found that the purposes of the act can be achieved without including resale rate provisions."

The letter and report were the result of reports brought to Representative Pierce by former Congressman Elton Watkins, of Portland.

## Central Arizona Reduces Rates in Phoenix Area

Reduced electric rates in Phoenix and other valley communities served by the Central Arizona Light & Power Co. went into effect Jan. 1, according to W. M. Cox, chairman of the Arizona Corporation Commission, who stated that the reductions would amount to a saving of $200,000.

The reduction is the third made by the company in five years, making an aggregate reduction during that period of $600,000. More than 26,000 consumers in Phoenix, Tempe, Glendale, Buckeye, Scottsdale, Peoria and Gilbert, together with those in other sections of the valley served by the company will benefit from the new rate schedule.

New residential rate will be 2c per day and 3½ per kw.-hr. for the first 120 kw.-hrs.; 2½ per kw.-hr. for the next 130 kw.-hrs. and 2c for all additional kw.-hrs., plus tax. This rate, according to company officials, is lower than any other residential rate in the state for similar services, and lower than many in inland cities much larger than Phoenix.

New commercial lighting and power schedules applying to customers with a demand of 3,000 watts or less will be 2c per day and 3½c per kw.-hr. for the first 500 kw.-hrs.; 2½c per kw-hr. for the next 2,000 kw.-hrs. and 1½c per kw-hr. for all additional kw.-hrs., plus tax.

### Colorado Cuts Declared

Electric light rates in six Colorado communities and counties were slashed 10% Dec. 1, E. E. Wheeler, chairman of the State Public Utilities Commission, reported. The Western Colorado Power Co. reduced both domestic and commercial rates, which will result in a $30,000 savings to consumers in Montrose, Telluride, Durango, Silverton and other neighboring districts. Power rates were also reduced 8% to a number of mining properties in the San Juan district.

## Building Permits for 1939 On the Upswing

Summary of permits issued and permit valuations by principal city and county building inspection departments in seven Western states revealed that in 1939 more than 17,000 more permits were issued than in 1938, while valuations increased by $33,500,000 over 1938.

Permits in 1937 totalled 146,405, against 154,547 in 1938 and 172,168 in 1939. California was responsible for 144,208 of these 1939 permits, while valuations in the state totalled $262,883,908 or nearly 85% of the total valuation. Washington ran second in seven Western states with 13,661 permits issued and a valuation set at $20,399,894. In March, 1939 alone, California valuation was set at $26,646,210.

● Kittitas County PUD has signed a contract with the Puget Sound Power & Light Co. for the purchase of power for its lines. The short-term contract is subject to approval by Federal Rural Electrification officials in Washington. It provides for a demand charge of $3 per kw. of demand, which entitles the district to 200 kw. of consumption per kw. of demand, and a rate of one cent per kw. on the first block of power at 0.6 of a cent on the next. Approximately 60% of the line has been built. When completed, it will cost about $95,000.

## Alaska Recommended for Full Territorial Government

Recommendations that the benefits of a full territorial government be conferred upon Alaska featured the annual report of Governor John W. Troy, which was transmitted to Secretary of the Interior Harold Ickes last month. Another high-light of the report was the number of water power sites of size suitable for individual industrial plants located in the national forests in Alaska.

Power surveys by the Forest Service, the Geological Survey, and the Federal Power Commission show the total year-round water power resources of southeastern Alaska equal about 800,000 hp. Fifty power sites, with an aggregate capacity of 22,000 hp., already have been developed for mining and public utility purposes.

## Fleming Named Representative On Hetch Hetchy Review

George A. Fleming, engineer of the Denver office of the Bureau of Reclamation, has been selected as the representative of the Dept. of the Interior to make a technical review of certain appraisals made by the Utilities Commission of the City and County of San Francisco as stipulated in the Raker Act, which authorized the construction of the Hetch Hetchy project by San Francisco.

Fleming is now in San Francisco, where he is working with Harold J. Boyd, controller of the City and County of San Francisco.

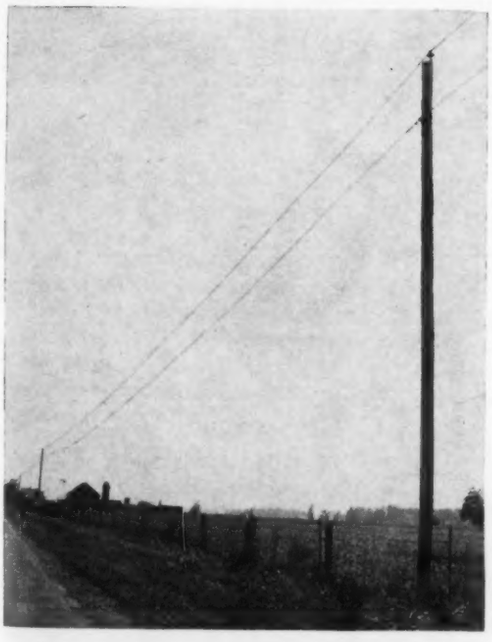
## Glendale Breaks Ground For New Steam Plant

Ground was broken late in November for Glendale's $1,800,000 municipal steam-generating plant. City officials, Chamber of Commerce officers and civic leaders participated in the ceremony on the site of the new building near Grand Central Air Terminal.

Expected to be completed by Dec. 1, 1940, the plant will generate electricity to augment the supply the city is receiving from Hoover Dam. All funds for the project are being furnished by the Municipal Public Service Dept., according to Peter Diederich, superintendent.

● The Columbia Engineering Co., Wenatchee, Wash., has been approved as project engineers for the Big Bend Electric Cooperative, Inc., Ritzville, Wash. P. L. Adkins, formerly of Roseburg, Ore., is resident engineer, and Rod Inbody of Chelan is field engineer. Cecil Harris, Spokane, will be office manager of the company.

REA to Promote Sale of Appliances
Far-Sighted Selling
THESE HEADLINES STRESS THE IMPORTANCE OF ADEQUATE LINE CAPACITY
Refrigerator
Up 53% for 6 Months
Show Light Lost by Undersized Wire
Lighting Market Can Be Quadrupled
Primary Load Up 9.1%
Washer Shipments Rise
Iowa Utility Extends Load Building Drive
Refrigerator Sales Continue Advance
Line Building Program Anticipates Added Load
Appliance Sales Soar in Mississippi Drive
Appliance Sales Continue Upward Trend
Rural Sales Meeting to Be Held by E.E.I.
Vacuum Cleaner Sales Up
Intensive Load Building Now Major Rural Job
Kellogg says industry is faced with making investments in rural lines successful and electricity useful to millions more citizens—

After a rural line is promoted, planned and built, demands for power must be built up. There can be no happy ending to this story unless the line becomes a paying proposition.

Can there be a happy ending to the story of your lines? By insisting on A.C.S.R. conductors, you can make certain that they'll have sufficient current carrying capacity to become self-supporting.

A.C.S.R. provides the highly desirable combination of high strength, resistance to corrosion and high conductivity which makes possible the construction of high quality, low cost lines. A.C.S.R. has a long history, over a quarter of a century, of successful performance.

ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh, Pennsylvania.

A·C·S·R

*Aluminum Cable Steel Reinforced*

FOR RURAL LINES AND POWER TRANSMISSION

## Contracts Awarded

To NePage Electric Co., Seattle, for metal enclosed buses for four generating units at Bonneville Dam, $105,600.

To Larson Construction Co., Denver, for construction of transmission line from Greeley to Fort Morgan, Colo., $33,365.

To California Electric Co., Santa Barbara, for electrical work on Santa Barbara State College building, $29,996.

To H. J. Langdon, Victoria, for electrical wiring in new barrack block for the Royal Canadian Air Force at Patricia Bay, near Victoria. Cost of barrack project about $75,000.

To J. H. McRae Co., Ltd., the electrical wiring contract for the new $65,000 women's building at Oakalla prison farm, Burnsby, Canada.

To C. C. Moore & Co., Los Angeles, for furnishing, installing 2 steam generating plants complete, ready to operate at owner's plant on foundation provided by owner, $148,200.

To Westinghouse Electric & Mfg. Co., Denver, for generator for Bureau of Reclamation for Minidoka project, $76,420.

To Railway & Industrial Eng. Co., Greenburg, Pa., for disconnecting switches for Bonneville project, $63,802.

To I-T-E Circuit Breaker Co., Philadelphia, for a 480-volt power switchboard for Bonneville project, $11,592.

To H. H. Walker, Los Angeles, for building 259 mi. of line for The Sulphur Springs Valley Electric Cooperative, Inc., Willcox, Ariz., $195,891.

To E. A. Reither, Aitkin, Minn., for building 210 mi. of line for the Southeast Colorado Power Assn., Lamar, Colo., $144,909.

## REA Activities

● Norman McKenzie has been appointed engineer of Colville (Wash.) County's $300,000 REA project, according to authorities in Washington, D. C.

Mountain Empire Electric Cooperative, Campo, Calif., has been awarded $35,000 to increase facilities of its project.

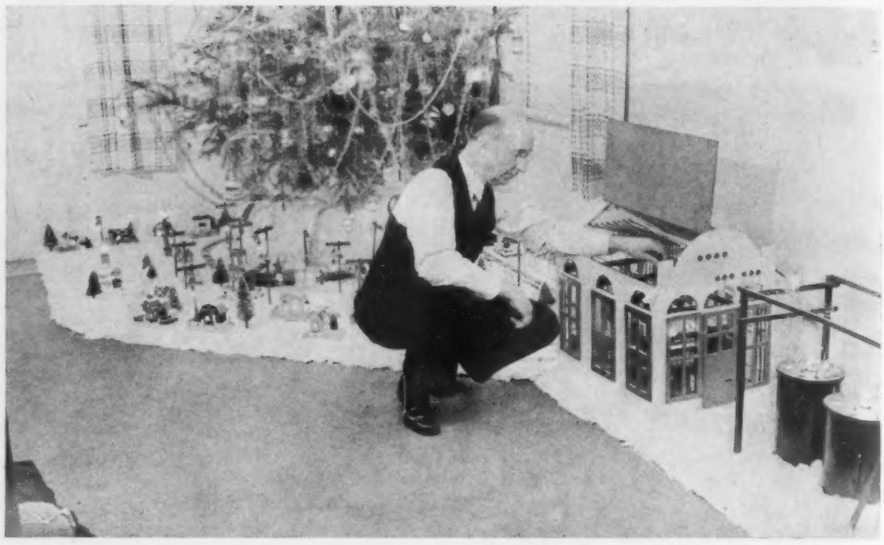
Otero County Electric Cooperative, Inc., Cloudcroft, N. M., has been allotted $80,000 to build 76 mi. of line in Otero and Chavis Counties.

Malheur Cooperative Electric Assn., Willowcreek, Ore., has been awarded $108,000 to build 115 mi. of line in Malheur County.

Grand Valley Rural Power Lines, Inc., Grand Junction, Colo., has been awarded $7,500 for house-wiring and plumbing installation.

San Luis Valley Rural Electric Coop., Monte Vista, Colo. has been allotted $5,000 for house-wiring.

High Line Electric Assn., Inc., has been awarded $3,500 for wiring.



A MINIATURE electrical distribution system, complete with working models of sub-station, transformers and distribution lines, was built by Glenn A. Patterson, Southern California Edison Co. Patterson, who is a member of the operating division of Edison's general office, operated his Christmas tree lights with this unique system, as well as homes, churches, a city hall in the "village"

## TRADE NOTES

● Northwestern Agencies, representatives for Ward Leonard Electric Co., have moved into new and larger offices at 2411 First Avenue, Seattle. The new location includes a warehouse for electric controls.

● The California Electric Service Station is newly located at 630 West Ninth street, Los Angeles, with Keith Chamblin, son and partner of Clyde Chamblin in charge.

● L. A. Nott, manufacturers' agent, conducted a meeting Jan. 2 of Sangamo Electric Co. distributors in San Francisco. E. J. Schulenburg, head of the Sangamo flasher division, who was on tour of the West Coast, showed the group color films of lighted billboards and spectacular displays throughout the country.

● George K. Springer will be in charge of the new showroom of Jordan & Co., Los Angeles, in the Western Merchandise Mart, San Francisco, according to E. J. Jordan.

● J. H. Beaty, Portland, formerly with Westinghouse Electric, now handles Wagner transformers in the Pacific Northwest as a distributor.

● A. M. Roberts, formerly sales manager of Lectrolines Division, Chanslor & Lyon Stores, Inc., has been appointed sales manager of the home appliance division of the California Electric Supply Co.

● Harper Meggee, Inc., Seattle, have been appointed distributors of Leonard refrigerators for the Pacific Northwest, according to R. F. Meggee, president of the firm. E. S. Carter will head the sales personnel, with Bert Pierce in charge of Kelvinator-Leonard sales at the Seattle headquarters.

● The Lee F. Austin Co., electrical equipment firm, opened Jan. 2 in new quarters at West 820 Second Avenue, Seattle. Formerly known as the Austin-Henderson Co., the company has been located at S. 118 Lincoln since 1928.

● F. E. Basler, general sales manager of the Gibson Electric Refrigerator Corp., Greenville, Mich., has named H. H. Basford, San Francisco, and Electrical Distributing Co., Portland, as new distributors, handling Gibson refrigerators and Gibson Kookall ranges.

● Philco Radio & Television Corp. held a convention for all Philco dealers in the West at San Diego, Jan. 24-26, to show new models in the refrigerator line. J. B. Parsons, advertising and sales promotion manager for the Pacific Coast, was in charge of the meeting.

● W. E. Graham, formerly manager of appliance sales in Kansas City for the General Electric Supply Corp., was named Jan. 15 to a similar position in the Seattle organization, according to H. C. Gerster, North Pacific district manager with headquarters in Seattle. Born in Davenport, Iowa, and educated in the Davenport schools, Graham joined General Electric in Kansas City as an accountant in 1924.

# Filling Empty Sockets!

**HELLO! OH, HELLO DEAR,** I didn't recognize your voice, this office is so noisy I can't—You want WHAT? You want me to stop on the way home and get a new *reading* lamp? For the love of Pete, what's wrong with the one we've—What's that? It won't *light?* Did you look to see if there's a bulb in it? Oh, there isn't! I just put a new hundred in there last night. What? You just remembered taking the bulb out yourself to put in the kitchen. That's fine! And may I ask what was wrong with the one in the kitchen? What? You had to put that one in the laundry? Uh-huh. And you want me to get a new bulb, I suppose. Well, I *won't*—wait a minute dear, don't get mad, I mean I won't get *one* new bulb, I'll stop and get a *whole slew* of new G-E MAZDA lamps, so neither of us will have to go round borrowing bulbs again. Okay darling. G'bye!

• • •

This announcement is typical of the sprightly, human "commercials" which every Sunday at 10 P.M. (E.S.T.—N.B.C. Red Network) plug the G-E slogan: "Eyesight is priceless. Light is cheap!"

The suave young man at the mike is none other than Allen Prescott, one of the announcers on the "General Electric MAZDA Lamp Hour of Charm," featuring Phil Spitalny's famous All-Girl Orchestra and the Woman-of-the-Week.

**G-E MAZDA LAMPS**

**GENERAL ELECTRIC**

JEFFRIES

TRANSFORMERS

BUILT TO ORDER IN A HURRY!!

When you are installing or re-arranging—and need a special transformer to **exactly** match your requirements—call on us. We can deliver in a week to 10 days.

Specify scattered transformers to eliminate duplicate conduit runs and save on power costs.

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave. Los Angeles, Calif.

Speed up range sales with CHROMALOX

*Super-Speed* UNITS

**Take advantage of *Chromalox advantages.* Sell fast, contact cooking, five heats, selective cooking areas, convenience, and a host of others. Sell ranges equipped with Chromalox Units. Ideal for replacement too—they fit all ranges. Write to our nearest distributor.**

REPRESENTED by

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
420 S. San Pedro St., Los Angeles, Calif.
THE PETERSON COMPANY
1921 Blake St., Denver, Colo.
EDWIN L. WIEGAND CO.
7540 Thomas Blvd., Pittsburgh, Pa.

# ABOUT PEOPLE

## Washington Water Power Names New Sales Personnel

R. B. McElroy has been appointed general sales manager of the Washington Water Power Co., Spokane, according to J. E. E. Royer, vice-president and general manager. *(See Profiles)*

McElroy is a native of Spokane, who after graduation from the State College of Washington in electrical engineering, went immediately into the sales department of the Washington Water Power Co. During the twenty odd years spent with the utility, he has held positions in the residential, commercial and industrial sales fields, specializing in merchandising.

Other changes announced effective Jan. 1, 1940, were as follows: M. R. Lund, selected as general commercial sales manager, A. H. Wegner, sales manager of the Spokane division, and Frank Tool, former sales manager of the Spokane division, named as manager of residential sales.

Lund was born in Minnesota and attended school there, coming to the Washington Water Power Co. in 1924. For six years he was in the residential department, was transferred to the commercial department and became commercial sales supervisor.

Tool was born in Kentucky, attended school in Washington, Los Angeles and Cincinnati, joining the Washington Water Power Co. in 1927 as a residential salesman. He later became supervisor of suburban residential salesmen and sales manager of the Spokane division.

Born in South Dakota, Wegner came to Washington and graduated from the State College of Washington with degrees in mechanical and electrical engineering. In 1925 he entered the engineering department of the Washington Water Power Co., transferred to the sales department later and became manager of commercial sales.

## Adams Appointed New Provo Plant Manager

R. C. "Rocky" Adams, formerly superintendent of the municipal plant at Fremont, Nebr., has been appointed manager of the new municipal plant under construction at Provo, Utah.

Also appointed by the City Commission were G. E. Gabby of Des Moines, Iowa, distribution engineer; T. J. Oldroyd, office manager; Roy W. Brown of the Schuyler, Nebraska city owned plant, chief engineer.

The Commission has given the Utah Power & Light Co. a 30-year franchise to operate and maintain a transmission line through the city to areas outside the city limits served by the company. The franchise does not include servicing consumers in the city, which was defeated in the November city election.

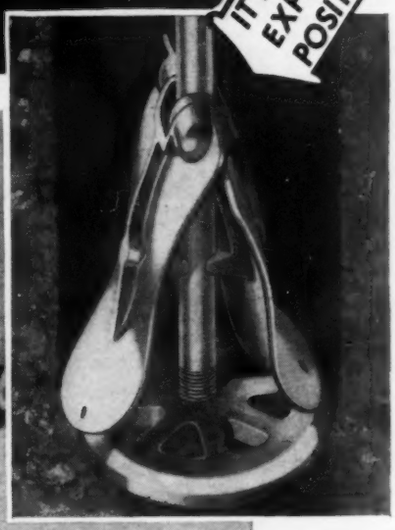
## Low Elected President of John A. Roebling's Sons Co.

E. C. Low, formerly San Francisco branch manager, has been elected president of John A. Roebling's Sons Co. of California succeeding F. A. Hammond, who has retired after 41 years of active service with the organization. Hammond's career with Roebling started in 1899 when he was employed in San Francisco as accountant. He has been successively treasurer (1918), sales manager and treasurer (1922) and president and sales manager (1925).

"Ernie" Low received his early schooling in South Dakota, coming to Los Angeles in 1908. He joined the Roebling organization in that city in

At the recent Hotpoint sales gathering in Biloxi, Miss., are (left to right) A. H. Jaeger, manager, Hotpoint water heater division; J. C. Platt, Hotpoint Seattle district manager; F. T. O'Brien, Graybar Electric Co., Seattle, and D. W. Rennewanz, Hotpoint Seattle district representative

# IT PAYS TO USE—KEARNEY ANCHORS WITH SPECIALLY DESIGNED EXPANDING BLADES



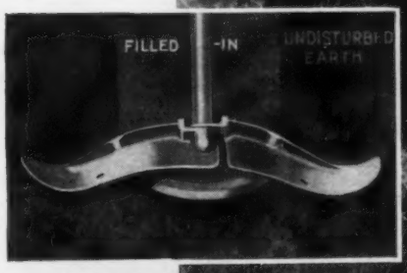

YOU get as much as 12,000 pounds holding power in ordinary soil—up to 20,000 pounds in clay when you install a Kearney No. 8136, 138 square inch area, 8-inch anchor.

You get proportionate tremendous holding power when you install other Kearney 2-Way Expansion Anchors that have scientifically designed blades—made of strong, genuine Certified Malleable Iron.

It will pay you, as it has so many operating men, to build maximum security into your lines by specifying Kearney 2-Ways—an easy to install, fully guaranteed anchor. Order a supply now and be ready for Spring Construction or emergencies. Write or ask a Kearney Representative.

**SCREW ANCHORS**

Have you investigated the time and money-saving advantages of using Kearney Screw Type Anchors for special adaptations? Be sure to ask about them.




## Use KEARNEY 2-WAY Hi-TENSION EXPANSION ANCHOR

EXCLUSIVE SALES REPRESENTATIVES **MAYDWELL & HARTZELL** INCORPORATED

LOS ANGELES • SAN FRANCISCO • PORTLAND • SEATTLE • PHOENIX • RENO • TACOMA • SPOKANE

1910 at the age of 17. After seven years in various office capacities in Los Angeles he was transferred to San Francisco as chief clerk to the president. In 1920 he went to Seattle as resident salesman, returning to San Francisco in 1924 as assistant to Hammond. In 1929 he was appointed sales manager of the San Francisco branch, a position he held until his latest promotion.


**CLASSIFIED SECTION**

**● COST of undisplayed classified ads is 5 cents a word, minimum $1.00 insertion. Box numbers in care of our San Francisco office count as 10 words additional in undisplayed ads. ● RATES per column inch of displayed ads is $3.75. ● All classified ads are payable in advance.**

SALESMAN or competent agency for residential and commercial lighting fixtures on Pacific Coast. Must have sales experience and thorough knowledge of illumination. CHASE BRASS & COPPER Co., Lighting Fixture Division, Waterbury, Connecticut.

**G.C.A.**
**Lamp Replacers**
**Lamp Base Removers**
**Cartridge Fuse Tongs**
**Switch Hooks**
*Send for Catalogue*
*We have been making safety tools for 24 years*
**THE G. C. A. Manufacturing Co.**
**Pittsfield, Mass.**

**ELECTRICAL TESTING LABORATORIES**
Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.
2 East End Ave. New York

**TORK CLOCKS**

NEW ELECTRICALLY DRIVEN 1940 MODELS NOW AVAILABLE
WITH PLAIN OR ASTRONOMIC DIALS

Whenever it is desired to turn Current on and off Regularly there is a new model Tork Clock that can do it.

**THE TORK CLOCK CO., Inc.**
MOUNT VERNON, N. Y.

Representatives:
A. R. Slimmon, 445 E. 3d St., Los Angeles
Nicholas & Cook, 1063 Howard St., S. F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City


Elmer A. Trask succeeds Low as sales agent and manager of the San Francisco branch. After his education in Minnesota he was employed by Roebling in 1925. He has held various office and sales positions with the company.

## Cox Named New Norge Sales Manager In Pacific West

Lee Cox, formerly divisional manager on the Pacific Coast for the Borg-Warner Corp., has been appointed Pacific Coast and Intermountain sales manager for all Norge products. Cox will make his headquarters in San Francisco. M. G. O'Harra, vice-president in charge of

sales also stated that N. M. Forsythe, former divisional manager, had been named western sales manager for all Norge departments, covering a territory from Denver to Chicago.

## Jarvis Succeeds Kelm At Utah Power

J. R. Jarvis, superintendent of lines and service for the Ogden Division of the Utah Power & Light Co., has succeeded Alfred C. Kelm as Salt Lake division superintendent of the utility.

Kelm was recently advanced to superintendent of system distribution replacing C. R. Higson now special consultant in connection with distribution engineering and operation for the entire system.

J. E. Cushman, Rexburg, Idaho division superintendent, is the new Ogden division superintendent and Charges M. Cannon will succeed Cushman.

● L. W. NIMS, Division manager of the Utah Power & Light Co. at Ogden, has been appointed to serve one of the key positions in that city's Community Chest Campaign for 1940.

● MISS HARRIET WALLACE, Idaho Power Co., took fourth prize in a Modern Kitchen Bureau contest conducted recently on electric water heaters. H. E. Reed, F. L. Dallenbaugh, and John Boyd, all of Idaho Power, also copped fourth prize awards.

● V. A. SHEALS, assistant cable design engineer at the G-E Schenectady works, visited the company's Pacific Coast offices during the last month. One of the men responsible for the development of oil-filled high voltage cable, he was awarded the Coffin medal for his contributions to cable technique.

● HERBERT METZ, manager of Graybar Electric's headquarters lighting division in New York, visited the Pacific Coast houses of the company during January.

● W. C. MAINWARING, merchandising head of the British Columbia Electric Railway Co., Vancouver, has been re-elected as vice-president of the Vancouver Exhibition Assn.

● LLOYD T. MCAFEE, chief construction engineer of the Public Works Commission, San Francisco, has been assigned the duties of the late Paul J. Ost, head of the commission's electric power bureau.

● HARRY R. BURTON, who has been serving as assistant advertising agent for the Nevada-California Electric Corp. in the Imperial Valley for the past three years, resigned last month to join McCann-Erickson advertising agency in Portland, Ore.

● E. M. SCHARA, formerly assistant Pacific Coast manager for Manning Bowman Co., San Francisco, has been transferred to the Chicago district. He will be succeeded by Robert Skov.

● J. M. COATS, Seattle, has been named superintendent of electrical installation work now under way at a giant naval air base at Sitka, Alaska, while L. M. Minton, Seattle, has gone north to become asst. superintendent at a new Kodiak base.

● ADAM S. BENNION, assistant to the president of the Utah Power & Light Co., has been elected president of the Salt Lake Oratorio Society.

● ROBERT M. TOWNSEND, property agent of Portland General Electric Co., Portland, was awarded a 50-year service pin at a ceremony in the company's board of directors' room Dec. 8. Townsend, who began working for the company's predecessor in 1888, is the company's oldest active employee.

# 27 ranges

**...for measurements in signal, control and electronic circuits . . .**

## THE NEW WESTON Industrial CIRCUIT TESTER

**(Model 785)**

### VOLTAGE RANGES

**DC Volts—0-1/10/50/200/500/1000 volts—20,000 ohms per volt**

**AC Volts — 0-5/15/30/150/300/500 volts — 1000 ohms per volt**

### CURRENT RANGES

**DC Current—0-50 microamperes, 1/10/100 milliamperes, 1 ampere and 10 amperes**

**AC Current — 0-.5/1/5/10 amperes (available through self-contained current transformer)**

### OHMMETER RANGES

**0-3000, 0-30,000, 0-300,000 ohms**

**0-3 megohms, 0 to 30 megohms (self-contained batteries)**

Compactness and light weight provide extreme portability. Sturdy oak carrying case measures only 13 x 12½ x 5½ in. Weight 13½ lbs.

The Model 785 Industrial Circuit Tester brings new convenience, new economy to production and maintenance testing. This compact, self-contained unit provides all the ranges necessary for voltage, current and resistance measurements wherever high sensitivity is a factor . . . including all types of signal systems, telephone circuits, photo-cell circuits, oscilloscope circuits, and for servicing network protectors, etc. . . . checking the electrical values in sensitive relays, cathode ray tubes, public address systems and amplifiers, thyratron tubes, etc. . . . as well as for many other plant production and maintenance requirements. Complete data on this new, relatively inexpensive test unit will gladly be sent on request. Weston Electrical Instrument Corp., 577 Frelinghuysen Avenue, Newark, N. J.

# WESTON *Instruments*

**WESTERN REPRESENTATIVES**

Seattle, Wash.
Eicher & Bratt,
263 Colman Bldg.

San Francisco, Calif.
Herman E. Held,
420 Market St.

Los Angeles, Calif.
A. A. Barbera,
Subway Terminal Bldg.

Denver, Colo.
J. W. Van De Grift,
623 Charles Bldg.

Phoenix, Ariz.
J. E. Redmond Co.,
448 W. Madison St.

## Sierra Pacific Power President Succumbs in New York

George A. Campbell, genial president of the Sierra Pacific Power Co., Reno, died in New York Jan. 12, following an abdominal operation, his second in three years. He had been associated with the Nevada utility since 1905 and had been an active figure in the civic life of Reno for more than 30 years.

Born in Sacramento in 1873 of a pioneer family, he was educated in Oakland public schools and later attended Stanford University where he studied mechanical engineering for three years. After a brief business career in Seattle and Oakland, he joined the Oakland Gas Co. in 1899 on the construction of the first large oil-gas generating plant on the Pacific Coast. Later he became superintendent of gas plant construction in the Pacific Southwest.

Campbell went to Reno in 1905 to erect a gas plant for the Reno Power, Light & Water Co. In 1906 he was made superintendent of the company's gas department and one year later became general manager of the utility, which had by that time absorbed the holdings of the Truckee River General Electric Co. In 1930 he was named president of the organization, which by then had been incorporated into the Sierra Pacific Power Co.

The company which he headed is distinct in many respects. Although a combination gas and electric utility it ranks close to the top in the percentage of electric range and refrigerator saturation. Its successful dealer merchandising plan has been widely copied. It has not been involved in municipal ownership agitations in any of its communities. Its standing with the public it serves has always been high. All of these are tributes to the ability and the human understanding of George A. Campbell.

● William L. Fox, Southern California Edison Co. employee since 1919, died Jan. 9. He was employed at the time of his death in the material and equipment sales department of the company's salvage store in Alhambra.

● Paul J. Ost, manager and chief engineer of the San Francisco Electric Power Bureau, died Dec. 30, in San Francisco. Among the projects he carried out was the design for the city's 100,000 hp. Moccasin Creek hydro plant. Mr. Ost first entered the service of the city 30 years ago, and also contributed much to the engineering work of the municipal railway and other public utilities.

## P G and E Vice-President Passes Away January 25

Arthur H. Markwart, Pacific Gas and Electric Co.'s vice-president in charge of engineering, died Jan. 25 at his home in Piedmont, Calif., after an illness of several months. He was 59, having been born in Duquoin, Ill., in 1880. A noted engineering authority, he was the author of many important treatises on both engineering and economics, and a frequent contributor to the editorial pages of Electrical West.

His career paralleled the plot of an Alger story. He came to California in his boyhood with his widowed mother and immediately went to work running errands and selling papers. He worked his way through the California School of Mechanical Arts and in later life was trustee and president of that institution. He also worked his way through the Univ. of California, being graduated in 1904 with an engineering degree and a membership in Sigma Xi for high scholarship.

Markwart's early professional work was with the Syndicate Water Co. of Oakland of which he became chief engineer and manager. Later he entered the consulting engineering field, first with Hilihan and Galloway and later as partner of Galloway and Markwart. From 1912 to 1915 he served as chief of construction for the Panama Pacific International Exposition. He joined PG and E in 1920 as director of engineering and two years later was made a vice-president. He served as president of the Pacific Coast Electrical Assn. in 1934 and under his direction the PCEA again became an active institution. He was a member of the ASCE and was a charter member of the San Francisco Engineer's Club.

## NEWA Attorney and Secretary Dies After Short Illness

Albert H. Elliot, revered attorney and secretary for the Pacific Division of the National Electrical Wholesalers' Assn., died in Oakland, Jan. 18, after a short illness. A man whose appearance and

activities belied his years, Elliot was born in San Francisco June 29, 1868. He was class valedictorian when he was graduated from Sacramento High School in 1887 and was commencement speaker for the Univ. of California, Class of 1891. His scholastic ability won him membership in Phi Beta Kappa.

He was admitted to the California bar in 1893 and has practiced law in San Francisco continuously since that time, except during the Spanish-American War when he served as master's mate aboard the *U.S.S. Iroquois*. For eight years he was a member of the city council of Oakland, where he resided.

A pioneer in the trade association field, Elliot's connection with the electrical industry started shortly after 1900 when he served as secretary for a local group of wholesalers' credit managers. He became secretary of the local Electrical Supply Jobbers Assn. in 1906 and continued to serve Pacific Coast wholesalers in that capacity until his death. Twice he saved the records of the organization from fire—first in 1906 and again in 1924 when the Del Monte Hotel burned.

# IMPROVED PERFORMANCE

# WITH NATIONAL CARBON BRUSHES

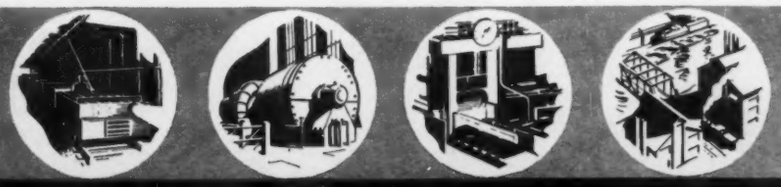
TRADE-MARK

● Performance of electrical equipment in transportation service is influenced to a marked degree by the proper selection and application of one small item—CARBON BRUSHES. Many transportation systems have improved performance by adopting "National" Carbon Brushes.

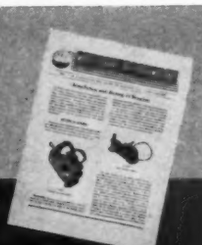
The engineering staff of National Carbon Company, Inc. is prepared to accurately analyze the factors involved in every brush application and to select, from an excellent assortment of brush materials, the grades capable of giving best performance on your equipment.

USE "NATIONAL" CARBON BRUSHES FOR DEPENDABLE AND SATISFACTORY PERFORMANCE

*When insulated shunt cables are required, glass fabric sleeving will be supplied if specified.*



There is a "National" Carbon, Graphite or Metal-Graphite Brush for every type of service.



## NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation UCC Carbon Sales Division, Cleveland, Ohio

General Offices: 30 East 42nd St., New York, N. Y. Branch Sales Offices: New York, Pittsburgh, Chicago, San Francisco

*If you are not receiving these informative bulletins let us put your name on our mailing list.*

## Index to Advertisers

### February, 1940


Allis-Chalmers Mfg. Co. ..... 26, 27
Aluminum Company of America ..... 93
American Steel & Wire Co. ..... 83

Blackburn Products Corp., Jasper ..... 4
Brewer-Titchener Corp., The ..... 89
Briegel Method Tool Co. ..... 6

California Oregon Power Co. ..... 68, 69
Chance Co., A. B. ..... 4
Chicago Flexible Shaft Co. ..... 4
Classified Section ..... 98
Columbia Steel Co. ..... 83
Copperweld Steel Co. ..... 19
Corning Glass Works ..... 17
Crescent Ins. Wire & Cable Co. ..... 7
Crocker First National Bank ..... 8

Driver-Harris Co. ..... 22

Electrical Testing Labs. ..... 98

Fast & Co., John E. ..... 16
Frigidaire Division, General Motors Sales Corp. ..... 20, 21

Gardner Electric Mfg. Co. ..... 90
G. C. A. Mfg. Co. ..... 98
General Electric Co. ..... 1, 13, 31, 77, 87, 95
Graybar Electric Co., Inc. ..... 81
Greenlee Tool Co. ..... 10

Honn Co., Geo. E. ..... 22
Hubbard and Company ..... 9

Idaho Power Company ..... 68, 69
Indiana Steel & Wire Co. ..... 8

Jeffries Transformer Co. ..... 96
Johns-Manville Corp. ..... 14, 15

Kearney Corp., James R. ..... 97

Lapp Insulator Co., Inc. ..... 23
Line Material Co. ..... 32

Maydwell & Hartzell, Inc. ..... 90, 91, 97
Montana Power Company, The ..... 68, 69

National Carbon Co., Inc., Carbon Sales Div. ..... 101
National Carloading Corp. ..... 18
National Elec. Products Corp. ..... 85
National Telephone Supply Co., The ..... 12

Okonite Company, The ..... 5
Okonite-Callender Cable Co., The ..... 5

Pacific Coast Elec. Bureau ..... Back Cover
Pacific Elec. Mfg. Corp. ..... 3
Pacific Gas and Electric Co. ..... 3rd Cover
Paine Company ..... 8
Pelton Water Wheel Co. ..... 84
Penn-Union Electric Corp. ..... 18
Portland General Electric Co. ..... 68, 69
Puget Sound Power & Light Co. ..... 68, 69

Reliable Electric Co. ..... 28
Roebling's Sons Co., John A. ..... 79

So. California Edison Co. Ltd. ..... 3rd Cover
Square D Company ..... 29

Tork Clock Co., Inc., The ..... 98

Union Carbide and Carbon Corp. ..... 101
United States Steel Corp. ..... 83
Utah Power & Light Co. ..... 68, 69
Utility Electric Co. ..... 6

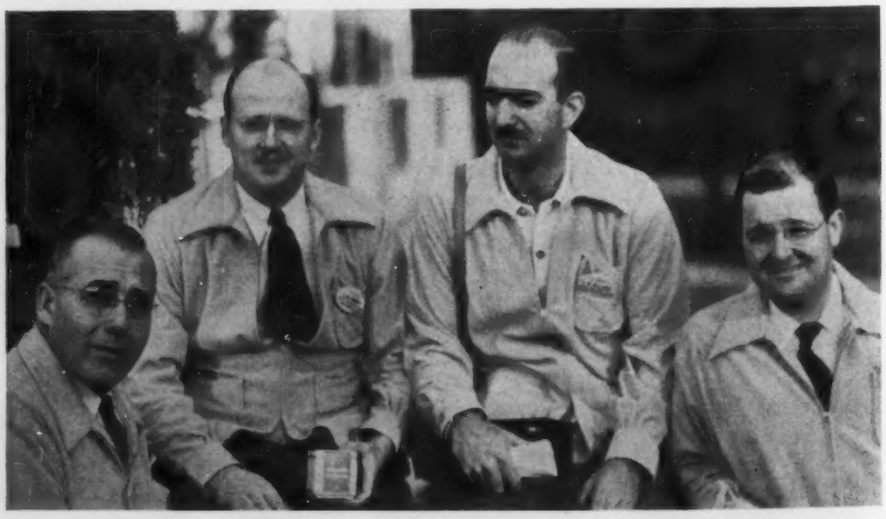
Wagner Electric Corp. ..... 25
Ward Leonard Electric Co. ..... 24
Westinghouse Elec. & Mfg. Co. ..... 11, 33, 34
Weston Elec. Instrument Corp. ..... 99
Wiegand Co., Edwin L. ..... 96


# PROFILES OF THE MONTH

R. C. Robinson (left) and S. A. Searle, both of Westinghouse, Los Angeles, are shown at the first annual Westinghouse Merchandising School held Dec. 9-11 at Mansfield, Ohio, for salesmen

R. B. McElroy was recently named general sales manager of the Washington Water Power Co., Spokane. He has spent more than twenty years with the utility, specializing in merchandising

M. R. Lund (left) has been appointed general commercial sales manager of Washington Water Power, while Frank Tool, former sales manager of the Spokane division, has been made manager of residential sales. Both men began their new duties Jan. 1, with headquarters at Spokane



(Left to right) M. H. Beekman, manager Hotpoint kitchen sanitation division; Roy Parry, Clyde Allen and Judd Whitehead, all of the Electric Kitchen Appliance Co., San Francisco, make up this foursome at the 1940 Hotpoint distributors meeting, held this year at Biloxi, Mississippi

# *Preview of coming campaigns by*

# P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

COMMANDS MORE SERVANTS THAN ALADDIN'S LAMP

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

**For next month—March**

## A FULL SCHEDULE OF LIGHTING ADVERTISING

TYING IN with the nation-wide effort to sell "better light for better sight", the Pacific Gas and Electric Company is devoting most of its March advertising space to lighting.

This advertising will include 305 billboards, 1050 truck banners, 50 window displays and 500,000 billstickers—plus 6 one-column fifteen-inch newspaper advertisements.

The newspaper advertisements were prepared with the idea of giving smaller dealers a foundation for a short, concentrated, inexpensive series of tie-in advertisements.

Instead of hitting the papers twice with 45-inch advertisements, we are running 6 smaller advertisements and running them often, at the rate of 3 a week.

This gives the dealer opportunity to run an advertisement of, say, 1 column by 4 inches, six times in two weeks at a total cost (in the smaller papers) of only $10 to $20.

With only a mention of fixtures, bathroom and kitchen bowls, pin-it-ups, adapter units, bulbs, electrical outlets and portable lamps, a miniature campaign like this should keep a dealer busy for a month.

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.

EW 102-240

# The Electrical Industry's "MAGINOT LINE"

First line of defense for the electrical industry is the wiring that is installed in every building constructed. Behind this line can be built a secure and uninterrupted future.

When a "Maginot line" wiring job goes in, the contractor reaps immediate profits by having a bigger and more profitable installation. The manufacturer of wiring supplies sells more wire and equipment. The building so wired becomes a potential market for more and more appliances on which the manufacturer and dealer may reap profits for its life time, and the utility has a continually increasing load.

If there is a saturation point for the application of electricity we are as yet unaware of where that point is.

Every building wired adequately is a bulwark of safety for the future of every man in the electrical industry.

Selling adequate wiring is no "one man" job. Build your share of this stronghold. The public is becoming increasingly conscious of the general need for adequate wiring. Educational work done over a long period of years is now getting results. At this point the responsibility becomes yours. Making the actual sale is one job you can do better than anyone else. One word from you is more effective among your customers and your friends than thousands of words they might read or hear from other sources.

Our "Maginot line" cannot be successfully built by delegating the work to others. It must have constant attention of everyone interested in the safety of his future and that of the electrical industry.

Talk wiring to your customers and friends, mention it in your advertising, have a line or two about wiring printed on your stationery—in fact, make every one you contact, wiring conscious.

**PACIFIC COAST** *Electrical* **BUREAU**

447 SUTTER STREET, SAN FRANCISCO • 601 WEST 5TH STREET, LOS ANGELES